Indiana Confined Feeding Regulation Program

GUIDANCE MANUAL

Presented by
Indiana Department of Environmental Management

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Introduction to CFO Program

327 Indiana Administrative Code Article16. Confined Feeding Operations

The purpose of this guidance manual is to provide information about 327 Indiana Administrative Code Article 16 (327 IAC Article 16) Confined Feeding Operations (CFOs) and to assist in better understanding the requirements of the Article. This manual contains information about CFO applications and approvals, design and construction, spill response, inspection procedures, manure handling and storage, manure application, closure of manure storage structures and exiting the CFO approval program.

Affected Regulation:
327 IAC Article 16 Confined Feeding Operations
IC 13-18-10 Indiana Statutes on Confined Feeding Operation

What is a CFO?

An animal feeding operation is a confined feeding operation if animals are confined and the following conditions apply:

- Confined for forty-five (45) days or more of a year, consecutive or nonconsecutive; and
- The confinement area is covered with less than fifty percent (50%) vegetation; and
- The number of animals exceeds the levels detailed below.

Confined feeding of at least:

1. Three hundred (300) cattle;
2. Six hundred (600) swine;
3. Six hundred (600) sheep;
4. Thirty thousand (30,000) fowl.

If the conditions apply and the number of animals exceeds the numbers listed above, then the operation is a CFO.

An animal production operation smaller than the confined feeding definition numbers does not fall under the jurisdiction of this rule, unless the operation has violated water pollution control laws.

IDEM may determine that confined feeding operations with animals other than those listed must comply with this rule, if necessary, to protect human health or the environment. All livestock farms which meet the definition of a CFO must acquire and maintain an IDEM approval. IDEM must approve the CFO prior to any new construction.

327 IAC 16-2-9 "Discharge" means any addition of any pollutant, or combination of pollutants, into any waters of the state from a point source. The term includes, without limitation, an addition of a pollutant into any waters of the state from the following:

1. Surface runoff that is collected or channeled by human activity.
2. Discharges through pipes, sewers or other conveyances, including natural channels that do not lead to treatment works.

327 IAC 16-2-45 "Waters," as defined in IC 13-11-2-265, means:

1. The accumulations of water, surface and underground, natural and artificial, public and private; or
2. A part of the accumulations of water; that are wholly or partially within, flow through, or border upon Indiana.

The term does not include:

1. A private pond; or
2. An off-stream pond, reservoir or facility built for reduction or control of pollution or cooling of water prior to discharge, unless the discharge from the pond, reservoir or facility causes or threatens to cause water pollution.

327 IAC 16-2-4 "Confined feeding" means the confined feeding of animals for food, fur, or pleasure purposes in lots, pens, ponds, sheds, or buildings where:

1. Animals are confined, fed, and maintained for at least forty-five (45) days during any twelve- (12) month period; and
2. Ground cover or vegetation is not sustained over at least fifty percent (50%) of the animal confinement area.

The term does not include the following:

1. A livestock market:
   A. where animals are assembled from at least two (2) sources to be publicly auctioned or privately sold on a commission basis; and
   B. that is under state or federal supervision.
2. A livestock sale barn or auction market where animals are kept for not more than ten (10) days.

327 IAC 16-2-5 "Confined feeding operation" means any:

1. Confined feeding of at least:
   A. three hundred (300) cattle;
   B. six hundred (600) swine or sheep; or
   C. thirty thousand (30,000) fowl.
2. Animal feeding operation electing to be subject to IC 13-18-10; or
3. Animal feeding operation that causes a violation of:
   A. water pollution control laws;
   B. any rules of the water pollution control board; or
   C. IC 13-18-10.

327 IAC 16-2-29 (a) "Owner/operator," for the purpose of this rule, means the person:

1. Who owns the waste management systems at the confined feeding operation; or
2. Who owns the livestock at the confined feeding operation and who applies for or has received an approval pursuant to this article; or
3. In direct or responsible charge or control of one (1) or more confined feeding operations or land application activity.

(b) This term includes contractors responsible for activities described in 327 IAC 16-1-1(a) at the confined feeding operation.

CFO Performance Standards

All confined animal-feeding operations must use the following performance standards when engaging in any agricultural activity:

- Avoid management practices that discharge pollutants into the state's waters.
- Minimize nonpoint source pollution to the state's waters.
- Design, construct and maintain waste management systems to prevent discharge of manure and other controlled waste and to minimize leakage and seepage.
- Stage and apply manure to land without threatening the state's waters; prevent runoff, ponding or spills; and minimize nutrient leaching beyond the crop root zone.

What must a new or existing CFO do?

Existing CFOs are not subject to design and construction requirements in this rule, but must be maintained and operated in compliance with approval conditions, this rule and state environmental laws. If an operation is defined as a confined feeding operation then the following must occur:

1. Obtain an approval prior to construction; see "Application & Approval Process" pages 4-12.
2. Construct facilities in accordance with the rule and approval; see "Design & Construction Requirements" pages 13-19.
3. Operate production facilities in accordance with the rule and approval; see "Operation Requirements" pages 20-23.
4. Conduct land application of manure in accordance with the rule and approval; see "Land Application of Manure" pages 24-29.
5. Complete an approval renewal application and Manure Management Plan in accordance with the rule; see "CFO Approval Conditions" page 5 and "Manure Management Plan" page 11.
6. Submit an approval modification for an increase in the amount of manure generated that:
   A. Reduces the storage capacity to less than the required storage capacity at the time of the most recent approval; or

327 IAC 16-2-16 "Ground water" means such accumulations of underground water, natural or artificial, public and private, or parts thereof, which are wholly or partially within, flow through, or border upon this state, but excluding manmade underground storage or conveyance structures.

   B. Results from an increase in the animal numbers, excluding swine, that weighs twenty-five (25) kilograms or less to:
      a. More than the numbers in 327 IAC 16-2-5, (Example: a 350,000 poultry operation with a nine percent (9%) increase would exceed the 30,000 animal approval level with a 31,500 bird increase, therefore requiring an additional approval); or
      b. Greater than ten percent (10%) of the approved animal capacity at the time of the most recent approval.
7. Expect an on-site inspection from one of IDEM's Office of Land Quality, Agricultural and Solid Waste Compliance Inspectors; see "Inspection Procedures" pages 30-32.

8. Exit or close in accordance with the rule and approval (if desired); see “Closure of Manure Storage Structures” page 33 and “Exiting the CFO Approval Program” page 34.

Application & Approval Process

Rule 7 Application & Approval Process for Confined Feeding Operations

Application Requirements

In Indiana a CFO must request and receive prior approval for the construction of a new facility, operation or building/animal expansion or qualifying renovation of an existing facility. All manure management structures approved before July 1, 1997 must be initiated by the effective date of this rule and completed within two (2) years of the effective date of this rule or are required to file a new application. Approvals issued on or after July 1, 1997 must follow construction schedules stated in the approval.

Affected Regulations:
IC 13-18-10.1 Confined feeding control: IDEM application
IC 13-18-10-2.1 Approval procedure; requirements; revocation
327 IAC 16-7-1 Applicability
327 IAC 16-7-2 Application requirements

What must be included in a completed CFO application?

Two (2) copies of the following must be included in the application and sent to IDEM for approval:

1. A completed application form; refer to "CFO Operation Approval Application" in the record book.
2. A plot map, refer to "Plot Maps and Farmstead Plan" page 9.
3. A farmstead plan, refer to "Plot Maps and Farmstead Plan" page 10.
4. A waste management system drawing; refer to "Design & Construction Requirements" pages 13-19.
5. Information obtained from at least two (2) test holes for soil and seasonal high water table information that are below the base of the proposed liquid manure storage structures and conducted by a certified soil scientist, a certified geologist, or a public or private Indiana registered engineer (list available at local county health departments). The test holes must adequately characterize the soil and seasonal high water table and be:
    a. At least two (2) feet below the lowest base of the storage structure for a concrete liquid waste storage structure; and
    b. At least five (5) feet below the lowest base of earthen liquid manure storage structures except in karst topography where test holes must go ten (10) feet deep or to bedrock, whichever is shallower.

To determine the number of test holes to perform, refer to NRCS Construction Standard #313.

327 IAC 16-2-6 "Construction" means fabrication, erection, or installation of a facility or manure control equipment at the location where the facility or manure control equipment is intended to be used. The term does not include the following:

1. The dismantling of existing equipment and control devices.
2. The ordering of equipment and control devices.
3. Off-site fabrication.
4. Site preparation.

327 IAC 16-2-44 "Waste Management System" means any method of managing manure or waste liquid at the confined operation, including:

1. Manure storage structures;
2. Manure transfer systems;
3. Manure treatment systems such as:
    A. a constructed wetland;
    B. vegetative management system;
    C. a wastewater treatment system under a National Pollutant Discharge Elimination System permit, or
    D. other system approved by the commissioner;
4. Feedlots;
5. Confinement buildings; or
6. Waste liquid handling, storage, and treatment systems.

6. A manure management plan, refer to "Manure Management Plan" page 11.
7. If a proposed alternative to a specific requirement in this rule is used, a description is required indicating equivalent environmental and human health protection in accordance with 327 IAC 16-5 Alternate Design or Compliance Approach, and Innovative Technology.
8. For new earthen liquid manure storage structures, certification of the structure design by a registered Indiana engineer.
9. A fee of one hundred dollars ($100); refer to "CFO Operation Approval Application" in the record book.

What other conditions may apply?

Additional provisions exist for two types of operations:

1. Operations that conduct confined feeding activities and have had a discharge enforcement, or
2. Confined feeding operations that have more than twenty (20) times the animal numbers listed in the "Introduction to CFO Program." (For example: 6,000 head of cattle or 12,000 head of sheep or swine or 600,000 poultry)

The additional conditions may include:

1. Public comment periods and hearings; refer to "Notification & Comment Periods" pages 7-9.
2. Additional design standards, operational requirements or other best management practices such as monitoring systems, liners, higher compaction levels, reporting, innovative technology or other protective measures.

CFO Approval Conditions

IDEM reviews all CFO applications for compliance with this rule and the Confined Feeding Control Law. IDEM will approve or deny an application based on compliance with these requirements. Renewal of an approval is required every five (5) years. CFO approvals must be transferred prior to a change in ownership of any facility.

Affected Regulations:
327 IAC 16-7-3 Duration of approvals
327 IAC 16-7-4 Approval renewals
327 IAC 16-7-5 Amendments and notifications
327 IAC 16-7-6 Revocation
327 IAC 16-7-7 Transferability

How long is an approval valid?

An approval is good for no longer than five (5) years. All confined feeding operation approvals issued prior to the effective date of 327 IAC Article 16 (Confined Feeding Operations) will expire five (5) years from the date of the submission of the most recently approved Manure Management Plan (MMP). Approvals issued after the effective date of 327 IAC Article 16 will expire five (5) years from the date the approval was issued.

How is an approval renewed prior to the five-- (5) year term?

An approval renewal must be submitted to IDEM by the owner/operator prior to the expiration of the current approval. Renewal reminders will be sent to owners/operators approximately six (6) months prior to the five- (5) year deadline. Renewal is granted for those operations without a discharge in the previous five- (5) year period when the owner/operator submits a MMP and an application renewal. The application for an approval renewal must include the following:

1. Name, address, phone number and contact person for the CFO.
2. An updated manure management plan.
3. Any changes in information from the current approval.

Refer to "Approval Renewal" form in the record book.

CFOs which have had a discharge resulting in an enforcement action within the previous five (5) years will be subject to:

1. The agency issuing a notice of public comment period,
2. The possibility of a public hearing, and,
3. The agency issuing a renewal approval, which may be appealed.

The renewal process should be initiated prior to the deadline. Operations that have not had a discharge during the previous five (5) years will automatically receive an approval renewal upon submitting a timely and complete renewal application, with no appeal process.

Can an approval be transferred to a new owner/operator?

If a CFO is sold, the approval must be transferred to the new owner. To transfer the approval, the original owner/operator must submit notification at least forty-five (45) days before the proposed transfer of the operation. The notification must be on IDEM form "Request for Approval Transfer." Refer to the record book. IDEM may request a revised MMP upon transfer of the operation approval.

When could amendments to a CFO approval be made?

IDEM may issue amendments to CFO approvals at any time:

1. Pursuant to IC 13-18-10-2.1(e) Water Pollution Control Law, CFO control;
2. To address phosphorous limits if adequate information indicates that the application of manure to land represents a water quality threat;
3. At the request of the applicant to address changes at the confined feeding operation that do not require a new approval (species change, frozen ground manure application, etc);
4. As a result of an agreement between IDEM and the owner/operator; or
5. Due to a reduction in storage capacity that results in less than one hundred eighty (180) days or the requirement of the original structure approval.

IDEM may require an issuance of a new approval for operations that increase animal numbers. Refer to "Application Requirements" page 4.

IDEM shall provide written documentation of the basis for issuing or denying an amendment. Any interested party may appeal decisions on approvals or approval amendments. The appeal must be submitted in writing within eighteen (18) days of receiving the notification of the decision.

What facility changes do not require a new approval?

The owner/operator of an approved CFO must notify IDEM in writing for the following facility changes:

1. Changes to the positioning of an approved structure that remains in compliance with the setback distances and within the boundaries identified in the farmstead plan and delineated by representative site borings.
2. Changes in the design or construction of an approved waste storage structure as shown in "as-built" plans. Prior notification of such changes is preferred to confirm the changes provide equivalent performance in the approved plans. (Example: a change in the installed reinforced steel)
3. Reduction in manure storage capacity that maintains at least one hundred eighty (180) days or detention time required in the original approval of combined storage at the confined feeding operation.
4. Transfers of ownership; refer to "Request for Approval Transfer" in the record book.
5. Correction of typographical or other minor errors within the approval or other minor changes as determined by IDEM.

Dead animal compost facilities. Minor changes may include type or size of animals and dead animal compost. These types of changes by the owner/operator must be reported to IDEM by using the "CFO Approval Change Notification" form in the record book. (Except for a transfer, which should be reported on the noted form.) Any other modifications must be applied for by using the "CFO Approval Application" form in the record book. Questions should be directed to the IDEM Confined Feeding Program, 1-800-451-6027 or 317-232-4473.

When would an application be denied?

IDEM may deny an application or place conditions on an approval:

- If the CFO, at the time of the approval decision, is not in compliance with water pollution control laws; or
- To prevent discharges of manure which pollute or threaten to pollute the state's waters. (Example: By repeatedly allowing the lagoon manure level to rise above the two- (2) foot required minimum, CFO #1 would be threatening to pollute.)

If an application is denied IDEM will provide written documentation of the basis for the denial. If IDEM places conditions on the approval IDEM will notify the owner/operator of the conditions.

Any interested party, including the owner/operator, may appeal denied applications. The appeal must be submitted in writing within eighteen (18) days of receiving the denial.

When can a CFO approval be revoked?

IDEM may revoke an approval or a condition in an approval as a result of a violation of:

1. Water pollution control laws;
2. Rules adopted under the water pollution control board laws;
3. IC 13-18-10 Confined Feeding Control Law;
4. 327 IAC 16 Confined Feeding Operations; or
5. Application conditions.

IDEM shall provide written documentation of the basis for revoking an approval or condition of an approval and give notice of the right to appeal the decision.

Public Notification & Comment Periods

An owner/operator who applies for approval to construct a confined feeding operation on land that is undeveloped or for approval to operate an existing CFO without a valid existing approval shall make a reasonable effort to notify adjoining landowners, occupants and county commissioners of the proposed CFO operation.

Affected Regulations:
327 IAC 16-7-12 Notice to adjacent landowners
327 IAC 16-7-13 Public comment periods and hearings

CFO Approval Notification

Who needs to be notified?

An owner/operator applying for a new CFO approval or an existing CFO seeking initial approval shall make a reasonable effort to notify:

- Anyone who owns land adjoining the land on which the CFO is or will be located.

- Anyone who lives on land adjoining the land on which the CFO is or will be located, such as renters or other potentially affected parties.
- The office of the commissioners of the county in which the CFO is or will be located.

This written notification must be completed by the owner/operator within ten (10) working days of filing the application. The date on which the application was submitted to IDEM and a brief description of the CFO to be approved (both existing and proposed) must be included in the notification document. A "Notification of Application Submittal" form is included with the application. Owners/operators may use this form or develop their own.

IDEM will notify the following parties once an application is received:

- County commissioners for the affected county(ies).
- Mayors of any affected city(ies).
- Town council presidents of affected town(s).

What notification documents must be included with the application?

The application includes two additional forms that must be completed and submitted:

- An affidavit stating that the owner/operator will provide the initial notice to the adjoining landowners or occupants and to the commissioners of the affected county.
- A list of others who may be affected, including those previously mentioned. (Examples: lenders, business partners, other affected landowners)

What will happen within the ninety- (90) day review period?

IDEM will issue or deny an approval within ninety (90) days of receiving a complete application. The IDEM permit staff who review applications for confined feeding approval will conduct an immediate completeness review. If deficiencies in the application are noted, a letter will be mailed via certified mail to the applicant within thirty (30) days. When the notice of application deficiencies is mailed, the ninety- (90) day review period is placed on hold until the applicant provides the requested information thereby making the application complete. Permit staff will also schedule a site inspection to observe the proposed site and to inspect the existing operation if one exists. These are scheduled during the review period and normally occur within ten (10) days of the application being determined to be complete.

The approval or denial will be mailed via certified mail to the applicant. All potentially affected parities identified by the applicant or otherwise will receive a copy of the approval via normal mail. IDEM also will notify all affected people (identified by the applicant) of the decision. Any person affected by the decision may petition for review of IDEM's decision within eighteen (18) days of the mailing date of the decision.

The Office of Environmental Adjudication (OEA), a separate agency from IDEM, is responsible for appeal decisions. An environmental law judge in the OEA will rule on requests for an administrative review hearing.

(Refer to "Approval Process Flowchart" in the appendix.)

Public Comment Periods and Hearings

When does a CFO application require a public comment period?

A thirty- (30) day public comment period is required when an application involves the following situations:

- A CFO has conducted confined feeding activities and has had a discharge prior to the application for an approval.
- If the CFO applying for approval has twenty (20) times the animal numbers listed in the definition of a CFO in 327 IAC 16-2-5.

- If a renewal application is filed for a CFO that has had an enforceable discharge within the previous five (5) years.

In these situations, IDEM will notify the public and solicit comments through a notice in a newspaper. A public hearing may be held.

What happens after the public comment period?

A comment period of at least thirty (30) days following the date of public notice shall be provided. During this period any interested parties may submit written comments on the approval application and may request a public hearing. A request for a public hearing shall be in writing and shall state the nature of the issues to be raised and the reasons why a hearing is warranted.

IDEM, after reviewing all comments, shall make a decision consistent with this article and applicable federal and state environmental laws.

When does a CFO application require a public hearing?

IDEM may hold a public hearing on an application when environmental concerns are raised relevant to applicable rules or laws and there is significant public interest in the application.

An IDEM public hearing is not a judiciary hearing. Comments are collected for further evaluation. IDEM only accepts comments during the hearing and does not defend any position. IDEM evaluates comments as they shed light on the application's compliance with this rule.

IDEM approves or denies the application based on fulfillment of the rule requirements. While environmental concerns may have an effect on an application, IDEM may not consider traffic, property values or local zoning when considering an application.

Plot Maps and Farmstead Plan

Plot maps and a farmstead plan that identify the location of the operation and the boundary of areas currently available for manure application must be submitted in the application to receive consideration for a CFO approval.

Affected Regulations:
327 IAC 16-7-8 Plot maps
327 IAC 16-7-9 Farmstead plan

Plot Maps

What must the plot maps show?

Plot maps must be submitted which include topographic maps and soil survey maps. The maps are available from most Natural Resources Conservation Service (NRCS) and Cooperative Extension Service offices. The following maps must be included in the application:

1. A soil survey map from United States Department of Agriculture Natural Resources Conservation Service; and
2. A United States Geological Survey topographic map that includes identification of any public water supply wells and public water supply surface intake structures within one thousand (1,000) feet of the manure storage structure.

The maps must clearly show the following:

1. The location of the waste management systems.
2. The property boundaries of the confined feeding operation.

3. The boundaries of all manure application areas.

Refer to the appendix for example maps.

The soil survey maps satisfy the map requirement for the manure management plan referred to in 327 IAC 16-7-11(a)(3).

Farmstead Plan

What must be in the farmstead plan?

The farmstead plan must show all existing and proposed waste management systems. It must include any other structures or land features within five hundred (500) feet of the waste management systems. Examples of other known structures or land features are:

- Residences,
- Surface waters,
- Public and private roads,
- Water wells,
- Characteristics of karst terrain,
- Drainage patterns,
- Property boundary lines,
- All outfalls of known subsurface drainage structures and
- Drainage inlets, including water and sediment control basins.
- Diversions of uncontaminated surface water.

The farmstead plan must be clear and drawn to scale or show specific distances between the structures and features mentioned earlier in this discussion. Refer to the appendix for an example of a farmstead plan. The plan must be on paper that is no less than eight and one-half (8 ½) inches by eleven (11) inches in size.

> **327 IAC 16-2-21 "Karst Terrain"** means an area where karst topography, including the characteristic surface and subterranean features, has developed as the result of dissolution of limestone, dolomite, or other soluble rock. Characteristic physiographic features present in karst terrains include the following:
> 1. Sinkholes.
> 2. Sinking streams.
> 3. Caves.
> 4. Large springs.
> 5. Blind valleys.

Waste Management System Drawings

The waste management system drawings must contain detailed views and necessary cross sections to define and show all dimensions and construction materials. Systems relying on gravity flow of water or manure must provide elevations of the entire waste management system.

Affected Regulations:
327 IAC 16-7-10 Waste management system drawing

What must be in the waste management system drawings?

1. Top view.
2. End view.
3. Side view.
4. Detailed view of wall, footings and floor reinforcement steel and water stop placement.
5. Location of seasonal high water table level relative to the base of waste storage system.

> **327 IAC 16-2-44 "Waste Management System"** means any method of managing manure or waste liquid at the confined operation including:
> 1. Manure storage structures;
> 2. Manure transfer systems;
> 3. Manure treatment systems such as:
>   A. a constructed wetland;
>   B. vegetative management system;
>   C. a wastewater treatment system under a National Pollutant Discharge Elimination System permit; or
>   D. other system approved by the commissioner;
> 4. Feedlots;
> 5. Confinement buildings; or
> 6. Waste liquid handling, storage, and treatment systems.

6. Details of all applicable structural components related to the waste management system.
7. Compressive strength of concrete in PSI values.
8. Floor and wall construction joints spacing and details.

Refer to the appendix for detailed examples of the elements needed to fulfill application requirements.

For technical assistance, refer to the NRCS Field Office Technical Guide (FOTG) Conservation Practice Standards #313 (Waste Management Systems), and NRCS Construction Guidelines (Chapter 10, Appendix 10D – Geotechnical, Design, and Construction Guidelines) and Midwest Plan Service Handbook #36, as applicable, to meet IDEM requirements.

Manure Management Plan

A manure management plan (MMP) must be submitted with all CFO approval and renewal applications. The manure management plan must be renewed at least one (1) time every five (5) years to maintain a valid approval for the confined feeding operation.

Affected Regulations:
327 IAC 16-7-11 Manure management plan
327 IAC 16-9-5 Operating requirements

What must be included in the manure management plan?

A manure management plan must include the following:
1. Procedures for soil testing.
2. Procedures for manure testing.
3. Legible soil survey maps of manure application areas. (Refer to "Plot Maps & Farmstead Plan" pages 9-10)
4. Land-use agreements for land not owned by the CFO owner/operator, including names of participants and identification of land sites.

Refer to "Manure Management Plan" in the record book.

When can a CFO replace land use agreements with manure distribution documentation?

IDEM considers manure distribution as an acceptable manure management procedure. Although a new CFO will need to present initial land-use agreements and/or soil survey maps to fulfill the requirements of this rule, an existing CFO, when reporting an approval renewal, may present manure distribution history to fulfill MMP requirements.

Credits of up to seventy-five percent(75%) of manure generated could be given for operations with two (2) years historical data and distribution records. Proportionately, credit could be given on the required amount of land application acreage. Conversions for manure and acreage requirements are on page 27, Table 2. (Example: A CFO with 30,000 broilers would need 41.7 acres (30,000 chickens/720 chickens per acre) of land available for manure application. The chickens would produce 10,950 cu.ft/yr. of manure (30,000(.001/day x 365 days)). If 100% of the manure were sold, then the CFO would need 10.4 acres (41.7 x .25) for land application.) If the CFO markets seventy-five percent (75) of the manure, credit can be taken for seventy-five percent (75) of the land requirement.

Soil Test Procedure

The soil testing procedure must be representative of the area to which manure is to be applied. The information must allow for adequate interpretation of soil fertility.

The testing frequency must be within a three- (3) year period unless a different frequency is justified in the MMP. Soil testing may be conducted in conjunction with other crop management procedures.

327 IAC 16-2-22 "Manure" means any liquid or solid animal excreta or any used bedding, litter or contaminated runoff.

327 IAC 16-2-42 "Waste liquid" means liquid to be handled as manure that is generated at the confined feeding operation, including:

1. Excess drinking water;
2. Clean-up water;
3. Contaminated livestock truck or trailer wash water;
4. Milking parlor wash water;
5. Milk house wash water;
6. Egg wash water; or
7. Silage leachate.

Manure Test Procedure

Manure tests must provide adequate information to calculate the application rate to meet crop nutrient recommendations. One (1) manure test must be completed for each type of manure (within a three (3) year sampling rotation). Example: a farrowing pit would require a separate test from that of the finishing pit. An operation with several finishing pits in which animals are of comparable size and diet could use just one (1) composite sample to represent them all.

Appeal of Decisions

IDEM will notify the owner/operator and all affected people (identified by the applicant) of the decision on submitted applications. Any person affected by the decision may petition for review of IDEM's decision within eighteen (18) days of the mailing date of the decision. An environmental law judge will decide if an administrative review hearing is warranted based on the information provided in the appeal requests.

Affected Regulations:
327 IAC 16-1-3 Appeal of decisions

How is an IDEM decision appealed?

An appeal is initiated by filing a written petition for administrative review with the Office of Environmental Adjudication within eighteen (18) days of the mailing date of the decision.

The petition must identify the approval or decision for which a CFO seeks review including: decision number, name on the approval, the reasons justifying the request and issues proposed for consideration for a hearing. More detailed appeal instructions accompany all IDEM approvals and decisions.

Design & Construction Requirements

Rule 8. Manure Handling and Storage; Site, Design and Construction Requirements

General Requirements for New Manure Storage Structures

Several requirements for site selection, design and construction apply to all new manure storage structures. Issues such as setbacks, soil structure, land topography and storage capacity are consistent as they apply to all types of manure. For technical assistance, refer to the NRCS Field Office Technical Guide (FOTG) Conservation Practice Standards #313 (Waste Management Systems), and NRCS Construction Guidelines (Chapter 10, Appendix 10D – Geotechnical, Design, and Construction Guidelines) and Midwest Plan Service Handbook #36, as applicable, to meet IDEM requirements.

The requirements that apply to all new storage structures will be addressed in this section. Additional requirements that apply to specific types of manure storage structures or manure handling systems will be discussed in specific sections for each type of system.

Affected Regulations:
327 IAC 16-8-1 Site restrictions for new waste management systems for liquid or solid manure
327 IAC 16-8-2 Waste management system setbacks
327 IAC 16-8-3 Design requirements applicable to all new waste management systems
327 IAC 16-8-4 Storage capacity for manure storage structures
327 IAC 16-8-12 Construction requirements for waste management systems
327 IAC 16-8-9 Design requirements applicable to other manure storage structures

Manure transfer and storage systems must be designed and constructed to minimize seepage and prevent spills.

Site restrictions for new waste management systems for liquid and solid manure

New waste storage systems must not be constructed in the following (exceptions also noted):

- Karst terrain (exceptions follow);
- A floodway;
- A 100-year flood plain, unless all waste storage system access is at least two (2) feet above the 100-year flood plain;
- Soil that is expected to be in the seasonal high water table, unless the water table is lowered to keep it below the bottom of the waste storage system;
- Over mines (exceptions follow).

IDEM may approve construction of a new waste management system in karst terrain or over mines based upon the following site-specific information submitted to IDEM:

- For earthen liquid manure storage structures, information from test holes at least five (5) feet below the lowest point, except in karst topography where the holes must go 10 feet deep or to the bedrock, whichever is shallower. Refer to NRCS Construction Standard #313 for more details.
- Characterization of the seasonal water table and soil; refer to NRCS soil survey book for engineering related properties or site-specific soil borings.
- Design specifications indicating adequate structural integrity and environmental protection.

327 IAC 16-2-2 "Bedrock" means cemented or consolidated earth materials exposed on the earth's surface or underlying unconsolidated earth materials.

- Other information that IDEM deems necessary to ensure protection of human health and the environment.
- Bedrock assessment (type and location).

327 IAC 16-2-34 "Sensitive area" means a site where conditions pose a specific water quality threat to one (1) or more of the following:

1. Aquifers used as a source of drinking water.
2. Public water supply wells.
3. Wellhead protection areas.
4. Drinking water supply reservoirs.
5. Areas requiring special protection such as:
   - A. Wetlands, except for wetlands constructed for manure management;
   - B. Karst terrain;
   - C. The critical habitat of an endangered species; or
   - D. Natural areas, including: parks; natural preserves, as regulated under IC 14-31; historic sites, as defined in section 18 of this rule; and public lands, as defined in IC 14-38-1-5.

Design requirements applicable to all new waste management systems

1. Designs for the lowest point of the base of a new manure storage structure must be at least two (2) feet above bedrock if not in a karst terrain, or if in a karst terrain, must be a distance above bedrock determined by IDEM.
2. Any drainage system used to lower a seasonal water table around the base of a waste management system must be equipped with an access point for sampling of drainage tile water.
3. IDEM may require additional design standards to protect human health or the environment in highly permeable soils and in areas with a high water table, steep slopes and proximity to bedrock or sensitive areas. These additional requirements may include groundwater monitoring systems, liners, higher compaction, innovative technology or other methods. IDEM will provide written documentation justifying requirements of additional standards that may be appealed.

For site-specific information or guidance, consult with an NRCS engineer or other private engineer.

Manure storage structure capacity

All new manure storage structures for confined feeding operations must be designed, constructed and maintained with a combined storage capacity of at least 180 days storage for:

- Manure (refer to Table 1 for average production volumes).
- Bedding (if applicable).
- Net average rainfall (if applicable).

Table 1:
Manure Storage Requirement Volumes*

System	Solid Cubic ft/day	Liquid Cubic ft/day
Swine		
Nursery Pig	.02	.05
Grow/Finish	.08	.18
Farrow(S&L)	.21	.51
Breed/Gestation	.09	.16
Dairy		
Calf	.13	.26
Heifer	.57	1.10
Cow	1.83	2.20
Veal Calf	.10	.15
Beef		
Feeder Calf	.32	.57
Fattening Cattle	.54	1.14
Mature Cow	.59	1.32
Poultry		
Broiler	.001	.004
Pullet	.001	.004
Layer	.002	.010
Turkey	.003	.011
Duck	.003	.011
Sheep		
Ewes	.11	
Lambs	.04	

*From Bulletin ID-101 (available through the Purdue University School of Agriculture). All data includes estimates of dilution and bedding additions for volume of manure that leaves storage for land application.

In addition, for uncovered manure storage structures, a twenty-four (24) inch freeboard is required to manage rainfall and run-off from a twenty-five-(25) year, twenty-four-(24) hour precipitation event. For Indiana this would range from 5.0 to 5.5 inches of rain. Existing buildings are not required to meet the new requirements, but will be

reviewed by IDEM if the CFO is cited for a water quality violation involving the existing site.

Waste management system setbacks

Waste management systems must be located so they maintain the minimum setback distances from the following "features of concern" that are known and identified at the time the application is submitted:

- One thousand (1,000) feet from a public water supply well or public water supply surface intake structure.
- Three hundred (300) feet (for liquid manure storage structures) or one hundred (100) feet for solid manure storage structures from surface waters of the state, drainage inlets (including water and sediment control basins), sinkholes (measured from the opening or the lowest point) and off-site water wells. Refer to "New Liquid Manure Storage Structures" page 16 and "Solid Manure Storage Structures" page 18.
- One hundred (100) feet from on-site water wells, property lines and public roads.

Setback conditions

Some setback distances may require special considerations:

- If a "feature of concern" (items mentioned above) were constructed within the required setback distance not in the control of the CFO owner/operator and after the application has been submitted, a different setback distance would apply. If a new waste management system were built, it could be no closer than the distance from the original CFO and the newly constructed feature.
- The owner/operator may request a reduced setback distance by demonstrating the use of innovative technology to IDEM that a different approach meets human health and environmental protection standards.
- If necessary, IDEM may request a greater setback distance to residences and public buildings based on surface gradient or other criteria related to human and environmental health. IDEM shall provide written documentation for this requirement.

Installation of tanks for manure storage

- Use of underground steel storage tanks is prohibited.
- Plastic and fiberglass tanks and above-ground steel tanks must meet following requirements:
  - Tanks must have sufficient strength to withstand design loads.
  - All tanks must be watertight.
  - Tanks previously used to store other substances must be cleaned before manure is put in the tank.
  - Tanks must be designed, installed or anchored to prevent flotation during seasonal high water.
  - Aboveground tanks must have protected shut-off valves for all inlet and outlet pipes.

Construction inspection procedures

A CFO with an approved application for construction must notify IDEM when construction of the waste management system begins. A "Construction Notification" form will accompany the CFO approval or can be duplicated from the record book to be used for the notification process.

IDEM will conduct random inspections on approved operations during construction. These inspections certify that construction is being conducted in accordance with the application that was submitted and approved by IDEM. Such issues include, but are not limited to, concrete compressive strength, grades of reinforcement steel, wall and floor thickness, reinforcement steel spacing in walls and floors, physical building placement and physical well placement.

Written documentation upon completion of construction

Within thirty (30) days after the completed construction of an approved waste management system, and prior to the introduction of animals, the owner/operator must notify the commissioner that the waste management system has been constructed and will be operated in accordance with the individual operations approval and this rule. A "Complete Construction Affidavit" will accompany the CFO approval or can be duplicated from the record book to be used for the notification process.

New Liquid Manure Storage Structures

General design and construction requirements have been discussed in the "General Requirements for New Manure Storage Structures" section. Requirements specific to new liquid manure storage structures are in addition to those general requirements. For technical assistance, refer to the NRCS Field Office Technical Guide (FOTG) Conservation Practice Standards #313 (Waste Management Systems), and NRCS Construction Guidelines (Chapter 10, Appendix 10D – Geotechnical, Design, and Construction Guidelines) and Midwest Plan Service Handbook #36, as applicable, to meet IDEM requirements.

Affected Regulations:
327 IAC 16-8-5 Design requirements applicable to all new liquid manure storage structures

Requirements for new uncovered liquid manure storage structure

- The design must include a minimum of two (2) feet of freeboard above the design storage requirement to contain the expected rainfall from a twenty-five (25) year, twenty-four (24) hour precipitation event that falls directly on the liquid manure storage structure.
- A marker must be located at the two (2) foot freeboard level. Care should be taken to protect the integrity of the storage liner when installing a marker system. Additionally, caution should be taken when working on the inside slope of any manure storage structure.
- An emergency spillway must exist to handle overflow for a new uncovered liquid manure storage structure that receives precipitation runoff from a drainage area, not including the manure storage structure surface area, which exceeds fifty percent (50%) of the surface area of the manure storage structure.
- An emergency spillway must direct manure to secondary containment, an appropriate manure storage structure or an approved vegetative management system. It also must be designed to handle the runoff of a rainfall collection area from a fifty- (50) year, twenty-four (24) hour precipitation event. This includes the surface area of the lagoon.

New Concrete Liquid Storage Structures

General design and construction requirements have been discussed in the "General Requirements for New Manure Storage Structures" and "New Liquid Manure Storage Structure" sections. Requirements specific to new concrete liquid storage structures are in addition to those general requirements. For technical assistance, refer to the NRCS Field Office Technical Guide (FOTG) Conservation Practice Standards #313 (Waste Management Systems), and NRCS Construction Guidelines (Chapter 10, Appendix 10D – Geotechnical, Design, and Construction Guidelines) and Midwest Plan Service Handbook #36, as applicable, to meet IDEM requirements.

Affected Regulations:
327 IAC 16-8-6 Design requirements applicable to new concrete storage structures for liquid manure

New concrete storage structure requirements

- A minimum of two test holes must be used to determine soil and water table information. The holes must be at least two (2) feet deep below the lowest point of the manure storage structure.
- Structural soundness is achieved through:
  - A concrete mixture that is well-proportioned and consolidated;
  - Minimal cracking;
  - Joints that are properly spaced, sized, designed and constructed;
  - Adequate reinforcement steel;
  - A foundation that provides necessary support; and
  - Use of water stops

New Earthen Manure Storage Structures

General design and construction requirements have been discussed in the "General Requirements for New Manure Storage Structures" section. Requirements specific to new earthen manure storage structures are in addition to those general requirements. For technical assistance, refer to the NRCS Field Office Technical Guide (FOTG) Conservation Practice Standards #313 (Waste Management Systems), and NRCS Construction Guidelines (Chapter 10, Appendix 10D – Geotechnical, Design, and Construction Guidelines) and Midwest Plan Service Handbook #36, as applicable, to meet IDEM requirements.

Affected Regulations:
327 IAC 16-8-7 Design requirements applicable to all new earthen manure storage structures for liquid manure

Requirements for earthen manure storage structures

- New earthen manure storage structures must not have a seepage rate that exceeds one sixteenth (1/16) inch per day.
- A minimum of two test holes must be used to determine soil and water table information. The holes must be at least five (5) feet deep below the lowest point of the manure storage structure.
- Designs must be certified by a professional engineer registered in Indiana (public or private).
- IDEM may require additional design standards to protect the environment such as: monitoring systems, liners, higher compaction, innovative technology or other protective measures. This IDEM decision will be provided in writing and will describe the basis for requiring additional design standards that may be appealed.

Solid Manure Storage Structures

General design and construction requirements have been discussed in the "General Requirements for New Manure Storage Structures" section. Requirements specific to solid manure storage structures are in addition to those general requirements. For technical assistance, refer to the NRCS Field Office Technical Guide (FOTG) Conservation Practice Standards #313 (Waste Management Systems), and NRCS Construction Guidelines (Chapter 10, Appendix 10D – Geotechnical, Design, and Construction Guidelines) and Midwest Plan Service Handbook #36, as applicable, to meet IDEM requirements.

Affected Regulations:
327 IAC 16-8-8 Design requirements applicable to solid manure storage structures

Requirements for solid manure storage structures

- Structures must not be constructed in sand or gravel soils unless specially designed with an approved liner. Soil types classified Unified Soil Classifications Pt, GW, GP, GM, GC, SW, SP, SM or SC must be avoided.
- Run-on from precipitation events must be diverted away from solid manure storage unless the design includes a method to collect and manage the contaminated runoff.

327 IAC 16-2-37 "Staging" means the temporary placement of manure in a pile at the site where the manure will be applied to land.

Stockpile and staging manure

Stockpiling of solid manure at a CFO is subject to the design standards of a solid manure storage structure. Stockpiling is a long-term storage method whereas staging is a temporary method. (Staging regulations are discussed on page 24.) Any CFO, existing or new, must have stockpile storage facilities included in the approval, if stockpiling is utilized in the manure management plan. Outside stockpiling is only permitted at CFOs with this manure management technique included in the approval.

A modification to an existing approval may be requested from IDEM by the CFO if stockpiling of solid manure is needed and is not included in the current approval.

Vegetative Management Systems & Constructed Wetlands

Vegetative management systems and constructed wetlands may be used to manage contaminated runoff. Several guidelines exist to use such structures in an environmentally friendly and efficient manner. For technical assistance, refer to the NRCS Field Office Technical Guide (FOTG) Conservation Practice Standards #313 (Waste Management Systems), and NRCS Construction Guidelines (Chapter 10, Appendix 10D – Geotechnical, Design, and Construction Guidelines) and Midwest Plan Service Handbook #36, as applicable, to meet IDEM requirements.

Affected Regulations:
327 IAC 16-8-10 Vegetative management systems
327 IAC 16-8-11 Constructed wetlands

Vegetative management systems

- A settling basin, low velocity channel or other equivalent structure must be placed between the vegetative management system and the source of the contaminated runoff or waste liquid.
- The settling basin or equivalent structure designed for the one (1) year, one (1) hour precipitation event must have sufficient capacity to store the contaminated runoff or waste liquid and the expected sediment.
- Vegetative management systems must have minimum dimensions based on the peak outflow from the confined feeding area or settling basin based on a twenty-five (25) year, twenty-four (24) hour precipitation event.

327 IAC 16-2-41 "Vegetative management system" means an area with vegetation designed to accept contaminated runoff or waste liquid after settling for the purpose of treatment or infiltration into the soil.

327 IAC 16-2-42 "Waste liquid" means liquid to be handled as manure that is generated at the confined feeding operation, including:

1. Excess drinking water;
2. Clean-up water;
3. Contaminated livestock truck or trailer wash water;
4. Milking parlor wash water;
5. Milk house wash water;
6. Egg wash water;
7. Silage leachate; or
8. Runoff that threatens water quality standards.

Constructed wetlands

- IDEM must approve the design of a proposed constructed wetland for manure treatment by a CFO.
- When applied to land, the treated wastewater must be applied following the land application requirements.
- Several state and federal requirements not listed here apply to the use of a constructed wetland as a reservoir for treated waste. CFO owner/operators must also abide by these requirements. Such requirements may be obtained through NRCS. National Pollution Discharge Elimination System (NPDES) requirements for discharge from a constructed wetland may also be applicable.

Operating Requirements

Rule 9. Manure Handling and Storage; Operational Requirements

Operating Records

Operating records must be maintained and updated by the owner/operator of an approved CFO and be available for inspection on site by IDEM. Refer to the record book for sample record sheets that fulfill the requirements for maintaining the operating records.

Affected Regulations:
327 IAC 16-9-5 Operating Record
327 IAC 16-9-4 Emergency Spill Response Plan
327 IAC 16-10-1 Required Acreage for Manure Application
327 IAC 16-10-2 Manure Application Rates
327 IAC 16-10-5 Marketing and Distribution of Manure

What must be in the operating record?

The following information must be maintained and updated in the operating record:

1. All valid approvals, modifications and notifications to the approvals;
2. Current manure management plan;
3. Current emergency spill response plan;
4. Record of monthly self-inspection reports for the past three (3) years;
5. Documentation of any spill response implemented by the CFO within the past five (5) years;
6. Information about acreage used for land application of manure, including:
   a. The calculation of the minimum amount of acreage needed for manure application;
   b. The amount of acreage available for application of manure;
   c. Land use agreements for any additional acreage needed to meet the minimum requirements;
   d. Updated documentation when there are changes in acreage required for application of the manure; and
   e. Copies of the written waivers in the operating records if there is any reduction in property line setback distances.
7. Records of land application activity on each field that has received manure for the previous five (5) years:
   a. Type of manure applied;
   b. Results of manure test;
   c. Soil tests (within a three-year sampling rotation) for all manure application sites;
   d. Amount of manure applied;
   e. Type of application method used;
   f. Locations and number of acres on which manure is applied;
   g. Dates on which manure was applied; and
   h. Agronomic rates of crops for potentially available nitrogen used to apply manure to each field.
8. Records from the past three (3) years of any person who received or purchased more than ten (10) cubic yards or 2,000 gallons of manure in a year. The following must be maintained:
   a. Name and address of the person who received or purchased the manure;
   b. The amount of the manure received; and
   c. A copy of the manure management information sheet.

Marketing and distribution records can replace land application records when fulfilling the MMP requirements for the CFO. Documentation must represent all

327 IAC 16-2-28 "Operating Record" means the written record of the confined feeding operation activities required by this article and kept by the owner/operator.

manure produced. Refer to page 11 for replacement requirements. Maintaining a current approved application in the operating record is not required, but is helpful when self-inspecting for compliance or when considering modifications.

Maintenance Requirements

All waste management systems must be maintained and operated as they were approved in the design plans submitted in the site approval. Any specific approval conditions for an operation will be listed in the IDEM approval. The owner/operator should correct deterioration or malfunctions of any parts of the waste management system.

Affected Regulation:
327 IAC 16-9-1 Maintenance Requirements
327 IAC 16-9-2 Transport and Handling

> **327 IAC 16-2-22 "Manure"** means any liquid or solid animal excreta or any used bedding, litter or contaminated runoff.
>
> **327 IAC 16-2-24 "Manure storage structure"** means any pad, pit, pond, lagoon, tank, building or manure containment area used to store or treat manure, including any portions of buildings used specifically for manure storage or treatment.
>
> **327 IAC 16-2-11 "Feedlot"** means an outside lot or pen used for confined feeding, including areas that may be covered, partially covered or uncovered.
>
> **327 IAC 16-2-26 "Manure transfer vehicle"** means a vehicle, tank, or wagon used to move manure.

What maintenance must be done?

- Records of monthly inspections of all waste management systems must be completed and maintained. Monthly inspections are a monitoring tool for potential storage problems and will add credibility to the level of oversight on the operation.
- Uncovered liquid manure storage structures must maintain a minimum of two (2) feet of freeboard unless specified differently in the approval. Freeboard is the distance between the top of the stored manure and waste liquid and the overflow level of the storage structure. This depth of freeboard minimizes the potential for discharge or lagoon outbreaks during high precipitation events.
- Uncovered liquid manure storage structures must be marked with a manure level marker indicating when manure should be removed to keep at least two (2) feet of freeboard available for emergencies.
- Maintaining appropriate freeboard throughout the year should be considered when scheduling manure application.
- Earthen berms for manure storage structures must be stabilized and maintained to allow visual inspections for erosion or animal damage. The berm may be stabilized with vegetation or alternative erosion control measures. Rodent and erosion damage may be subtle but must be controlled to prevent structural damage.
- An owner/operator who plans to use a vegetative management system must operate and maintain the system to provide effective treatment.
- Runoff from feedlots must be minimized and controlled.

Transportation Requirements

Pumping, dumping, or allowing the leakage or drainage of manure from transfer vehicle onto unauthorized premises, public thoroughfares, or into the state's waters is prohibited. Refer to "Compliance Guide" in the record book.

Spills & Spill Response Plan

An emergency spill response plan must be developed by all confined feeding operations prior to the start of production. For existing CFOs, emergency spill response plans must be developed within ninety (90) days of the effective date of this rule. It should outline detailed steps that will be taken to contain and manage a spill in the event one occurs. The emergency spill response plan is to be maintained in a location accessible to all employees, including the manager or owner. Familiarize employees involved in manure handling with the implementation of the spill plan and allow implementation when they deem it necessary.

Affected Regulation: **327 IAC 16-9-4 Emergency Spill Response Plan**
Related Regulations: **327 IAC 2-6.1 Spill Rule**

Spills

What is a spill?

A spill is defined as "any unexpected, unintended, abnormal, or unapproved dumping, leakage, drainage, seepage, or discharge or other loss of petroleum, hazardous substances, extremely hazardous substances, or objectionable substances. The term does not include releases to impermeable surfaces when the substance does not migrate off the surface or penetrate the surface and enter the soil." Manure and wastewater from CFOs fall into the category of "objectionable substance."

> **327 IAC 16-2-35 "Spill"** means any unexpected, unintended, abnormal, or unapproved dumping, leakage, drainage, seepage, or discharge or other loss of petroleum, hazardous substances, extremely hazardous substances, or objectionable substances. The term does not include releases to impermeable surfaces when the substance does not migrate off the surface or penetrate the surface and enter the soil.
>
> **327 IAC 2-6.1-4(11) "Objectionable substances"** means substances that are (A) of a quantity and a type; and (B) present for a duration and in a location; so as to damage waters of the state.

A spill should be reported if it threatens to enter or enters the state's waters, crosses property boundaries or is not being managed. While this definition of "spill" is broad, CFO owners/operators should recognize that not all spills are reportable or a violation.

What makes a spill reportable?

A spill, which does one of the following, should be reported:

1. Enters the state's waters.
2. Crosses property boundaries.
3. Is not being managed to prevent a threat to the state's waters which includes groundwater.
4. Threatens to damage the state's waters.

If you have experienced a reportable spill you are required within two (2) hours of discovery to communicate a spill report to the Indiana Department of Environmental Management, Office of Emergency Response: (Toll Free) 1-888-233-7745 for in-state calls; (317) 233-7745 for out-of -state calls.

Spill Response Plan

What should be considered in a spill response?

- Remember, personal safety is always first priority.
- Immediately locate the source of the release and take steps to prevent any further discharge from the release point or source.
- Quickly assess the overall situation and evaluate the extent of the release. (Have the waters of the state been impacted as a result of the spill? If not, is there an imminent threat to the waters of the state? Have any field tiles been impacted as a result of the release?

Approximately how much was released and for what duration?)

- As soon as possible initiate measures to contain all waste material (i.e., earthen berms or temporary dams, interceptor ditches, or other practices).
- Once effective containment has been achieved the collection phase of the released material will need to begin. Recovered waste material usually is managed in one or more of the following methods:
  1. Return all recovered waste to the waste storage collection system (i.e., surface lagoon, in-ground pits or other approved storage structures).
  2. Apply to land in compliance with regulations.

What information must be included in an emergency spill response plan?

An emergency spill response plan should be designed to answer five basic questions:

1. Who is responsible for the operation and for implementing the spill response plan?
2. Who should be informed of the spill?
3. What are potential problem areas?
4. What resources are available to respond to the spill?
5. What can be done to clean up the spill?

Who is responsible to implement the spill response plan?

- Owner and manager.
- Employees.
- Emergency Response Personnel.

Who must be contacted?

Call the Office of Emergency Response within 2 hours of the spill at 1-888-233-7745.

Who should be contacted?

Others who could potentially be affected:

- Downstream water users within ten (10) miles, such as livestock watering areas or swimming locations.
- Surface intake structures in towns, cities or private ponds likely to be affected by a spill.
- Natural areas such as state parks and urban recreation areas likely to be affected by a spill.

What are potential problem areas?

(Areas where problems could occur and may be included in the spill response plan.)

- Lagoon overflow.
- Pit overflow.
- Transportation.
- Manure stockpile.
- Land application.
- Equipment breakage.

What resources are available to respond?

(Other solutions and resources may apply.)

Resources possibly available to stop spill:

- Name and phone number of someone who has a bulldozer or earth moving equipment.
- Backhoe or skid steer loader to divert flow of runoff to containment area.
- Main water and electric control locations with posted shut-down procedures.
- Hay bales, dirt, etc. to contain spill.

What can be done to clean up?

(Other solutions and resources may apply.)

Application equipment to clean up spill:

- Traveling gun.
- Tank wagon.
- Manure spreader.
- Cultivation equipment for incorporation.
- Submersible pump.
- Rental equipment as needed.

Locations for manure application:

- Wheat stubble (yours or neighbor's).
- Pasture.
- Alternate containment (extra pit, lagoon or stockpile location).

Refer to "Emergency Spill Response Plan," in the record book.

Land Application of Manure

Rule 10. Land Application of Manure

General Requirements

Manure from CFOs in Indiana or other states applied to Indiana land must be applied so it does not enter or threaten to enter the state's waters and in accordance with this rule. Manure should be used as a nutrient source and not as a waste product. CFO owner/operators must prevent runoff, ponding for more than twenty-four (24) hours and spills. In addition, every effort must be made to minimize nutrient leaching beyond the root zone.

Affected Regulations:
327 IAC 16-3-1-e Manure application
327 IAC 16-10-2 Manure application rates
327 IAC 16-10-3 Manure application activities

What are the requirements for manure management activities?

Manure management and application includes the following techniques: staging/stockpiling, incorporation, injection, irrigation and surface application. Each technique presents unique nutrient management opportunities and challenges. Several guidelines address the best management practices for manure application to land.

Staging Manure Requirements

- Manure staged for more than seventy-two (72) hours must be covered or otherwise protected to prevent runoff and applied to the site within ninety (90) days.
- The procedure of storage of manure outside at the CFO is considered stockpiling and must be included in the approval.
- Staged manure must be more than three hundred (300) feet away from surface water, drainage inlets and water wells unless there is a barrier or surface gradient between the staged manure and the clean water.

327 IAC 16-2-23 "Manure Application" means the placement of liquid or solid manure by:
1. Spraying or spreading onto the land surface;
2. Injection below the land surface; or
3. Incorporation into the soil.

327 IAC 16-2-19 "Incorporation" means the mixing of liquid or solid manure, with the surface soil using standard agricultural practices, such as tillage.

327 IAC 16-2-20 "Injection" means the placement of liquid manure beneath the surface of the soil in the crop root zone using equipment specifically designed for this purpose.

327 IAC 16-2-38 "Surface Application" means the placement of manure by spraying or spreading onto the land surface.

327 IAC 16-2-37 "Staging" means the temporary placement of manure in a pile at the site where the manure will be land applied.

327 IAC 16-2-17 "Highly Erodible Land" means land that has a high potential to erode based on site-specific characteristics, such as slope length and steepness, rainfall, runoff, wind, soil type, and soil conditions.

327 IAC 16-2-31 "Public Water Supply Surface Intake Structure" means any structure used for the purpose of providing water through a public water supply system.

- Manure staging must be on a gradient less than six percent (6%) unless runoff and run-on is controlled.
- Manure cannot be staged in a waterway or in standing water.

Liquid Manure Spray Irrigation Requirements

- Spray irrigation must not be used on any land that has less than twenty (20) inches of soil above the bedrock unless in accordance with an approved spray irrigation plan.
- Spray irrigation must have one of three (3) environmental control or prevention measures in place: (1) by pressure loss monitors to detect leaks and to shut down the system if leaks are detected, or (2) be under constant supervision by a person, or (3) in accordance with a spray irrigation plan approved by IDEM.
- Spray irrigation in a flood plain must be conducted in accordance with a plan approved by IDEM.
- Spray irrigation of liquid manure to snow-covered frozen ground is prohibited. This does not include surface application by tank wagon or other manure transfer vehicle. (See general requirements below)

General Manure Management Requirements

- Newly approved CFOs may not apply manure to frozen or snow-covered ground. CFOs may request a variance from IDEM for this requirement.
- Liquid or solid manure must not be applied to frozen or snow-covered ground without residue protection or crop cover with slopes in excess of two percent (2%).
- Manure cannot be applied to land from equipment that is operating from a public road.
- Liquid or solid manure may be applied to highly erodible land if the land has adequate residue protection or crop cover, or in accordance with a conservation plan.
- If soil incorporation is a part of a liquid manure management system, it must be completed within twenty-four (24) hours of application.
- Manure shall not be applied to saturated soil.
- The owner/operator needs to concentrate on retaining the manure nutrients when managing land application.

Manure application records are discussed in detail in the "Operating Records" section, page 20.

What must be documented when manure is marketed or distributed?

The following guidelines must be followed if more than ten (10) cubic yards or two thousand (2,000) gallons of manure are given or sold by the owner/operator to a single individual.

1. An information sheet must be provided to the person who receives the manure, including the name and address of the CFO, a statement indicating that it is unlawful to allow the manure to enter the state's waters, nutrient content information for the manure and manure application requirements.
2. The owner/operator must retain information that includes the name and address of the person receiving the manure, the amount of manure distributed to that person, signatures of both parties and a copy of the information sheet. This information must be available for review during an inspection.

Refer to "Manure Application Record" in the record book.

327 IAC 16-2-2 "Bedrock" means cemented or consolidated earth materials exposed on the earth's surface or underlying unconsolidated earth materials.

327 IAC 16-2-12 "Filter Strip" means a relatively uniform and maintained vegetated area used for collecting sediment and cleansing run-off.

327 IAC 16-2-36 "Spray irrigation" means the application of manure or waste liquid on the land through a stationary or mobile sprinkler type system.

327 IAC 16-2-13 "Flood Plain" means any area adjoining a river, stream, or lake that has been or may be covered by a one hundred (100) year flood.

Manure Application Setbacks

Manure application setbacks are specific for surface water and water structures. Refer to Table 2 "Setback Distances" on page 27 for specific situations.

Affected Regulations:
327 IAC 16-10-4 Manure application setbacks

What are the setbacks that must be followed during manure application?

These guidelines must be followed:

- "Incorporation" in Table 1 refers to applications that have been incorporated within twenty-four (24) hours of placement on the land.
- All setbacks must be measured from the edge of the manure-spreading pattern.
- Properly designed and maintained filter strips allow the setback distance to be the width of the setback strip.
- The setback is ten (10) feet if a gradient barrier is between the application site and the water source.
- When dealing with setbacks from property lines, adjoining property owners may waive the required setback in a written document to be maintained with the manure management record sheet in the operating records.
- The owner/operator may obtain a reduced setback by demonstrating to the commissioner that a different compliance approach meets the performance standards in this rule.
- When referring to setbacks for manure application, surface water includes intermittent flowing streams and ditches.
  - Water in underground tile systems is not considered surface waters. IDEM believes surface inlets to those systems are sensitive and require setbacks. Nutrients that directly and indirectly enter a tile system could cause a water quality violation where the system empties into surface waters. Land application in accordance with the rule should prevent nutrient entry into tiles.

327 IAC 16-2-39 "Surface Water" means water present on the surface of the earth, including:
1. Streams;
2. Lakes;
3. Ponds;
4. Rivers;
5. Swamps;
6. Marshes; or
7. Wetlands.

327 IAC 16-2-7 "Contaminated Run-off" means any precipitation or surface water that has come into contact with any liquid or solid animal excreta or any used bedding, litter, or waste liquid at the confined feeding operation.

327 IAC 16-2-32 "Public Water Supply Well" means any well that provides water to the public through a water distribution system that:
1. Serves at least twenty-five (25) persons per day for:
a. Drinking;
b. Domestic use; or
c. Other purposes; or
2. Has at least fifteen (15) service connections.

327 IAC 16-2-10 "Drainage Inlet" means any surficial opening to an underground tile drainage system that drains to waters of the state. For the purpose of this article, "drainage inlet" includes water and sediment control basins.

327 IAC 16-2-16 "Gradient Barrier" means a structure or feature that prevents run-off from entering waters of the state.

Table 2:Setback Distances (in feet)

Known Feature	Liquid Injection	Single Pass Incorporation (liquid or solid)	Liquid Incorporation (within 24 hrs.)	Surface Application To Pasture	Surface Application (solid or compost)	Liquid Surface <or = to 6% slope or residue cover	Liquid Surface > 6% Slope
Public water supply wells & public water supply surface intake structure	500	500	500	500	500	500	500
Surface water	25	25	50	50	50	100	200
Sinkholes	25	25	50	50	50	100	200
Wells	50	50	50	50	50	100	200
Drainage inlets	5	5	50	50	50	100	200
Property lines & public roads	0	0	10	10	10	50	50

Manure Application Rates and Calculations

CFOs are required to do soil and manure tests to calculate the manure application rates prescribed for the crop that is current or planned for the upcoming growing seasons. The test results, the calculations and the application records must be kept in the operating records and must be available during routine inspections. Examples of calculations and worksheets for calculating manure transport vehicle capacity are presented in the appendix. Additional information is available in several Purdue Cooperative Extension Service and NRCS publications. Refer to the appendix for a list of these and other publication.

Affected Regulation:
327 IAC 16-10-1 Required acreage for manure application

How much ground is required for manure application?

Calculations must be used to determine the minimum amount of acreage required for manure application. There are three ways to meet this requirement:

- An existing CFO may use application rates that do not exceed one hundred fifty (150) pounds of potentially available nitrogen per acre per year **until April 1, 2002**. After that date soil and manure tests must be used to determine agronomic rates.
- Newly approved CFOs have one (1) year to begin testing manure and soil to make manure application decisions.
- An owner/operator must establish agronomic rates of the intended crop based on potentially available nitrogen provided by the soil test and manure test. Nutrient uptake of crops is based upon yield results, variety of crop and soil tests.
- An owner/operator may demonstrate to IDEM that a smaller amount of acreage can be used by submitting information on the type of manure generated, an

alternate method of managing manure, use of innovative technology or other criteria related to protecting human health or the environment.

Any acreage required for manure application that is not owned by the owner/operator must be documented by land use agreements signed by the property owners and maintained in the operating record. They must be available for routine inspection. Refer to the record book for a sample land use agreement.

How do new and existing CFOs calculate required acreage?

Values in Table 3 can be used until values from tested samples can be established. By using the figures in Table 3, the owner/operator can calculate the amount of manure that can be applied per acre per year and the number of acres needed per year. Alternative numbers may be used if documented through testing or scientific publication.

Table 3: Manure Application Land Requirements

Animal Capacity/Acre/Year*	Solid	Liquid	Lagoon
Swine:			
Nursery Pigs	100	80	320
Grower/Finishing	22	17	65
Farrowing (S & L)	14	13	40
Breeding/Gestation	29	25	90
Dairy:			
Dairy Calves	29	23	105
Heifers	6	5	18
Cows	3	2	9
Veal Calves	28	21	100
Beef:			
Feeder Calves	11	9	40
Fattening Cattle	5	4	16
Mature Cows	7	5	20
Poultry:			
Broilers	720	490	2725
Pullets	600	500	2660
Layers	420	300	1745
Turkeys	365	165	700
Ducks	500	465	1975
Sheep:			
Ewe	17		
Lambs	36		

*Based on available N for a 150#N/acre application rate and a one-time facility capacity with full year use, not animals produced per year. Acreage values and dilution ratio recommendations can be found in Bulletin ID 101 (available through the School of Agriculture, Purdue University). Additional dilution information can also be found in the NRCS Agricultural Waste Management Field Handbook, or Pork Industry Handbook (PIH) 63.

Example 1: Hog operation "A" plans to produce at a one-time capacity of 10,000 finishing hogs in a liquid manure management system. According to the "Liquid" column and "Grower/Finishing" row, seventeen (17) pigs would produce manure for one acre at the 150

pounds of the potentially available nitrogen limit. Therefore, 10,000 pigs divided by seventeen (17) would equal 588 acres per year needed for manure application. 10,000/17 = 588 acres

Example 2: Poultry operation "B" plans to produce at a one-time capacity of 200,000 broilers. According to the "Solid" column and "Broiler" row, 720 chickens would produce manure for one acre at the limit of one hundred fifty (150) pounds of potentially available nitrogen. Therefore 200,000 chickens divided by 720 would equal 277 acres per year needed for manure application. 200,000/720 = 277 acres

Much more information is needed to calculate the required amount of acreage needed when using manure and soil sampling tests. Refer to Purdue Cooperative Extension Service publications AY 277 "Calculating Manure and Manure Nutrient Application Rates" and AY 278 "Estimating Manure Spreader Capacity." Additionally, AY 278 is helpful to all CFOs when calculating the amount of manure to be applied per acre based on spreader capacity. Refer to the appendix for these publications.

327 IAC 16-2-30 "Potentially available nitrogen" means the nitrogen that could be realistically taken up by a crop during one (1) growing season. Potentially available nitrogen is usually calculated as the sum total of:

1. Ammonium nitrogen;
2. Nitrate nitrogen; and
3. The percent organic nitrogen that will mineralize in one (1) growing season.

327 IAC 16-2-1 "Agronomic rates" means a rate of application of manure to the land based on:

1. The nutrient content of the manure to be applied;
2. The fertility level of the soil;
3. The nutrient needs of the current or planned crops;
4. The nutrient holding capacity of the soil; and
5. Additional sources of nutrients including legume credits, process wastewater, biosolids or commercial fertilizer.

Inspection and Enforcement Procedures

Rule 4. General Approval Conditions

Inspectors & Inspection Procedures

Inspections determine compliance with the regulations and update IDEM on the status of a farm operation (i.e., out of business or exiting IDEM's CFO program). Most inspections are routine and do not involve a complaint or a spill. Refer to the appendix to find the inspector for your operation and for samples of inspection reports.

Affected Regulation:
IC 13-18-4-5 Restrictions on pollution of water: unlawful acts
IC 13-30-2-1 Prohibited acts: acts prohibited/potential discharge
IC 13-18-10-2.1 Confined feeding control: IDEM determination on application
327 IAC 2-1-6 Water quality standards
327 IAC 2-6.1 Spills; reporting, containment, and response
IC 13-18-10-1 Confined feeding control: IDEM approval must precede construction of confined feeding operation
IC 13-18-10-2.1(d) Confined feeding control: IDEM determination on application/possible violation of approval
327 IAC 16 Confined Feeding Operations

What will happen during an inspection?

Inspection Notification

The inspectors will make reasonable efforts to contact the owner/operator at least twenty-four (24) hours prior to the initial inspection of a confined feeding operation. If reasonable efforts to contact the owner/operator are unsuccessful the inspector may conduct the inspection unannounced. Bio-security measures will always be respected, even during unannounced routine, complaint or spill inspections.

The inspector should communicate the specific date and approximate time of the inspection. The owner/operator is to accompany the inspector when possible. Inspections performed after the initial inspection do not require prior notification.

No prior announcement will be made in an investigation of a complaint or a spill.

Bio-security

Bio-security measures and issues should be discussed during the initial conversation. Bio-security procedures required beyond the basic procedures listed below should be documented in writing and given to the inspector to be kept on record. The inspector also should record the disease status of the operation and schedule inspections appropriately.

The inspector shall present credentials and follow the bio-security procedures developed by the specific operation or by the Indiana State Board of Animal Health. During the inspection the inspector will wear disposable boots, disinfect rubber boots between operations, or use site-specific clothing and footwear as directed by the operation. Any operation-specified bio-security equipment must be available at the CFO for use by the inspector.

To reduce disease transmission, inspectors will not enter the confined feeding buildings unless absolutely necessary and under pre-approved conditions. The inspector will schedule poultry inspections at least forty-eight (48) hours between inspections of other poultry operations, except in the case of a complaint or a spill response.

Owner/operator Responsibilities

The owner/operator shall allow the inspector to:

1. Enter the confined feeding operation premises.
2. Have access to records kept under the terms and conditions of the approval and the rule. When necessary, copies may be requested for specific records. The owner/operator may request a confidentiality form be filed with the documents. Refer to "Confidentiality Claim" form in the record book.
3. Inspect, at reasonable times, any monitoring equipment or method, waste management systems or practices required or otherwise regulated under the approval and the rule.
4. Sample or monitor any release to evaluate compliance with the approval or as otherwise authorized.

YOUR INSPECTOR WILL:

1. Treat you professionally and with respect;
2. Provide identification from IDEM;
3. Understand the regulations and approval requirements;
4. Schedule the initial routine inspection;
5. Abide by bio-security requirements;
6. Wear disposable boots during the inspection;
7. Not enter livestock buildings unless absolutely necessary and pre-approved;
8. Communicate necessary corrective actions and completion schedules;
9. Leave a written inspection report or indicate it will be mailed within forty-five (45) days;
10. Appear unannounced if there is a complaint filed or a report of a spill.

What will the inspector review to determine compliance?

1. The inspector will review the operation's approval to determine compliance with approval conditions and rule regulations.
2. The inspector will review the items listed in the "Compliance Guide" in the record book along with any site-specific requirements. A time frame for actions required to return to compliance, if deemed necessary, will be included in the report.

The inspector will document findings and observations. The report will be reviewed with the owner/operator if he or she is present. A copy of the report will be left with the owner/operator, who will be asked to sign the report. The owner/operator's signature only verifies that the inspector performed the inspection and that a copy was left for the owner/operator's records. It does not mean that the owner/operator agrees or disagrees with the findings and observations.

If the inspector is unable to complete the inspection report on site or the owner/operator is not present, a copy of the inspection report will be mailed within forty-five (45) days following the inspection. Refer to "IDEM CFO Inspection Report" and "IDEM CFO Land Application Inspection Report" in the appendix.

Questions and/or concerns pertaining to inspection procedures or inspectors should be sent in writing to IDEM, Office of Land Quality, Agricultural & Solid Waste Compliance Section, Section Chief, 2525 North Shadeland, Indianapolis, IN 46206.

In an enforcement situation, IDEM investigates the circumstances surrounding the cause of the noncompliance and looks first to the person or persons actually responsible for the violation.

Noncompliance with an approval condition is a violation and the owner is responsible for assuring compliance with the conditions of the approval. Any allocation of liability among private parties is a private, contractual matter. Such private contracts do not affect IDEM's ability to enforce the conditions of the approval.

Refer to "Compliance Guide" in the record book.

Enforcement Policy

IDEM's policy is to work with CFOs to resolve any outstanding compliance problems. Formal enforcement action generally will be reserved for situations in which an operator has not adequately responded to requests to correct operational problems or to situations in which the water quality has been threatened or harmed.

Affected Policy:
327 IAC 16-4-4 Enforcement

When is an enforcement action taken?

Anyone who causes or allows manure or waste to be discharged into the state's waters or across property boundaries may be subject to an IDEM enforcement action.

An approved CFO that is found in violation of other requirements listed in this rule, such as land application or record keeping, may not be subject to an enforcement action if the violation:

- Is corrected immediately or within a reasonable time frame specified by IDEM written notification;
- Is not the same type of violation that has been documented within the previous five (5) years; and
- Is not one of multiple concurrent violations that represent a threat to the environment.

IDEM will operate the compliance program consistent with these criteria. IDEM reserves the right to initiate enforcement for any violation of the rule if circumstances warrant it in order to maintain the integrity of the program and to protect the environment and public health.

The exception to this general policy would be a discharge from application of manure to frozen or snow-covered ground. Application of manure to snow-covered or frozen ground is inherently risky and should be performed only as a last resort. Any discharge across property boundaries or into the state's waters from this type of application will result in an enforcement action.

Closure of CFO Structures

Rule 11. Closure of Manure Storage Structures

Closure of Manure Storage Structures

Closure of a manure storage structure can be temporary or permanent. The type of structure will dictate the steps that need to be followed. Specific rules apply and are addressed in this section. A manure storage structure is deemed closed when the environmental threat has been removed.

Affected Regulation:
327 IAC 16-11-1 Applicability
327 IAC 16-11-2 Temporary shut-down of manure storage structures
327 IAC 16-11-3 General closure requirements

Temporary shutdown of a manure storage structure

Temporary closure, which is removal of livestock from portions or all of a CFO, may occur without reporting to IDEM. Temporarily closed manure storage structures must be maintained in accordance with this rule and the CFO approval conditions. Appropriate freeboard must be maintained. Self-inspections, general maintenance and IDEM inspections are still required.

After three (3) years of a temporary shutdown the waste storage structure must be emptied and cleaned out in accordance with the manure management procedures in this rule.

Closure of waste storage structures must follow NRCS Closure Technical Standards (#390).

Closure of a portion or conversion of a manure storage structure

If an operation is planning to close a portion of the waste storage structure, but is not closing it entirely, the owner/operator must apply for a modification to the approval and will need to recalculate the storage capacity for the revised CFO. Modification requests must be sent to IDEM before demolishing or converting the use of any manure storage structure.

Closure of a manure storage structure

The owner/operator of a CFO who plans to close or discontinue use of a manure storage structure must:

1. Remove all the manure from the manure storage structure and:
   (a) Apply it to the land in compliance with the manure land application sections of this rule, or
   (b) Manage it in accordance with this rule as well as applicable state and federal laws.
2. Remove all associated equipment and conveyance structures from uncovered liquid manure storage structures;
3. Continue to maintain the manure storage structure so there is no release until the manure is removed;
4. Submit a modification form to IDEM within thirty (30) days of closure of the CFO. Refer to "Closure Certification" form of the record book;
5. Pass an IDEM closure inspection.

If additional closure activities are required to protect human health and the environment IDEM will notify the CFO in writing, specifying those activities.

Exiting the CFO Program

Rule 12. Exiting the Confined Feeding Approval Program

Exiting the CFO Approval Program

Exiting the CFO program should be done with much review and consideration. Once an operation has exited the program, the approval is void. Requesting a new approval later must be done under new requirements. This will involve public notification, new application preparation and additional approval fees. Operations that may return to production when economic situations improve or when ownership is transferred to a new operator may benefit from maintaining the initial approval. Based on site-specific reasons and situations, some CFO owners/operators may determine that exiting the program is the best business decision. Exiting the CFO program is allowed if the operation meets certain guidelines outlined in this section.

Affected Regulation:
327 IAC 16-12-1 Applicability
327 IAC 16-12-2 Exiting the confined feeding approval program due to a reduction in size of operation
327 IAC 16-12-3 Exiting the confined feeding approval program due to a complete closure of the operation

How does an operation exit the CFO program?

There are two (2) ways a farm can exit the program:

1. A confined feeding operation may be removed from the regulated confined feeding approval program, but continue to operate as a smaller operation, if the department has been notified that the confined feeding operation has and will maintain fewer than the following number of animals:
    a. Three hundred (300) cattle;
    b. Six hundred (600) swine;
    c. Six hundred (600) sheep; or
    d. Thirty thousand (30,000) fowl.

2. A CFO may be removed from the regulated confined feeding approval program and completely closed if the department has been notified that:
    a. All livestock animals are removed from the site; and
    b. The confined feeding operation closes all manure storage structures.

Criteria for exiting the program:
1. The number of animals at the operation;
2. Operation and maintenance practices;
3. Compliance history;
4. Manure storage capacity;
5. Quantity of manure at the operation;
6. Other criteria relative to protection of the environment and human health.

Who reviews the criteria for exiting the program?

The record book includes a "CFO Request for Approval Voidance" form. This form, once completed by the owner/operator and sent to the Solid Waste Permits Section, Office of Land Quality, IDEM, will notify the department that an operation requests removal from the CFO Program. An inspection will be done to determine if the voidance should be granted.

Voidance will be granted if:
- The operation has no animals or manure and does not intend to return to production or

- The operation has a number of animals below the CFO threshold, does not intend to expand to the CFO threshold, manure is properly managed, and there is no water quality violation in the history of the operation.

If an operation does not meet voidance criteria the inspector will write a review of actions needed to meet voidance criteria. A follow-up inspection will be conducted to confirm voidance requirements have been met.

IDEM will send the owner/operator a letter of confirmation when the inspector has verified that the criteria have been met for exiting the program.

Refer to "CFO Request for Approval Voidance" in the record book.

Other Environmental Concerns

Spill, Dead Animal Disposal, Open Dumping & Open Burning Rules

Related Environmental Regulations

Several other state regulations exist and may apply to CFO production activities. Listed below are some of the most commonly violated regulations. The rules have been summarized here and are not comprehensive. Refer to the specific rule for a complete explanation of the regulation.

Spill Rule

Affected regulation: **327 IAC 2-6.1**

The Indiana Spill Rule applies to the reporting and containment of, and response to, spills of hazardous substances, extremely hazardous substances, petroleum and objectionable substances that are of a quantity, type, duration and in a location to damage the waters of the state.

All farms have a number of materials which, if spilled, would be reportable under this rule. Some of these materials include fuels, lubricants, manure, dairy products, pesticides and fertilizers. Any one of these materials has the potential to degrade water quality and even cause illness, injury or death of aquatic life. Containment, reporting and clean up of these spills helps ensure that the citizens of Indiana protect surface and ground waters for future uses such as drinking, recreation and agriculture. It is important to remember that all spills must have an immediate response and that spills to water usually have a greater potential for environmental harm.

The responsibilities of those who spill are listed in the rule and include:

1. Contain spilled materials from waters of the state,
2. Initiate a spill response, including the most effective containment action possible,
3. Report the spill within two (2) hours of discovery to the Department of Environmental Management, Spill Line, **1-888-233-7745**. Criteria for determining if a spill should be reported are listed separately for facilities (on your property) and transportation (off your property).
4. Submit a spill report to IDEM if requested in writing by the department,
5. Notify neighbors and downstream water users if spills enter water or their property.

The rule is several pages long and this summary explanation is not comprehensive. For more information, please read the spill rule in its entirety. For the purposes of this rule manure is considered an objectionable substance. For more specific questions or to report spills, please contact the Indiana Department of Environmental Management, Emergency Response staff at 888-233-7745.

Open Dumping

Affected regulation: **IC 13-30-2-1, IC 36-9-30-35 and 329 IAC 10**

Dumping is prohibited. To cause or allow the open dumping of garbage or of any other solid waste is in violation of the solid waste rules. All regulated solid waste must be disposed at a state permitted solid waste facility. The owner of real estate upon which an open dump is located is responsible for correcting and controlling any nuisance conditions which must include removal of all solid waste and disposal of such waste in a permitted solid waste

facility, or other methods approved by the commissioner.

The only materials excluded from this prohibition that may be dumped or buried are:

1. Uncontaminated rock, bricks, concrete, road demolition waste or dirt;
2. Uncontaminated and untreated natural growth including tree limbs, stumps, leaves and grass clippings;
3. Sawdust that is derived from processing untreated natural wood.

Regulated solid waste includes but is not limited to: household garbage, construction and demolition debris, appliances, furniture, tires, plastic, cardboard and hazardous waste.

Open Burning

Affected regulation: **IC 13-30-2-1, and 326 IAC 4-1**

Open burning is defined under 326 IAC 4-1-0.5(6) as "the burning of any materials wherein air contaminants resulting from combustion are emitted directly into the air, without passing through a stack or chimney from an enclosed chamber." Open burning generally is prohibited in Indiana. There are exceptions, however, which are described in the rules on “Open Burning,” found in 326 IAC 4.

Conditions Allowing Open Burning:

All of the various allowable open burning activities described on this page can only be performed under certain conditions:

- Burning must occur during safe weather conditions, not during high winds, temperature inversions or on pollution alert days.
- Burning must occur during daylight hours.
- Fires must be attended until completely extinguished.
- Fires must be extinguished if they create a hazard, nuisance, pollution problem or threat to public health.
- Fire fighting equipment adequate for the size of the fire must be nearby.
- Burning activities must comply with all other federal, state and local laws, rules and ordinances.

The following are types of fires that are allowed:

- Maintenance burning of vegetation;
- Recreational or ceremonial fires of clean wood, charcoal, paper, or petroleum products;
- Burning, for the purpose of heating, clean wood products or paper in a noncombustible container
- Prescribed burning by the Indiana Department of Natural Resources or the U.S. Forest Service;

Open Burning at Private Residences:

Residential open burning (household or yard waste) is banned completely in Lake, Porter, Clark, and Floyd counties. In all other Indiana counties, private residential (buildings with 4 or fewer dwelling units, but not apartment or condominium complexes or mobile home parks) open burning is permitted by state law in accordance with the following rules:

- Only paper or clean wood products (woody vegetation, leaves, or wood which is not coated with stain, paint, glue or other coating material, and no treated lumber) may be burned. Burning other types of household waste such as various types of plastic is illegal.
- Materials may only be burned in a noncombustible container that is sufficiently vented to induce adequate combustion and has enclosed sides and a bottom; burning on the ground is illegal.

Burning activities must comply with all other federal, state and local laws, rules and ordinances. It is particularly important that residents check with their local fire or health department because some cities or counties may have local ordinances, which may be more stringent than state open burning laws.

This summary of the open burning rule is not comprehensive. For more information, please read the open burning rule in its entirety.

Dead Animal Disposal

Affected regulation: **IC 15-2.1-16-20**

For the purposes of this requirement, "dead animals" do not include fish, reptiles, or small animals of any kind such as dogs, cats, and small game. Dead animals shall not be allowed to lie on the premises. Any animal body shall be disposed of within twenty-four (24) hours after knowledge of the death so as not to produce a nuisance. Disposal must be by one of the following methods:

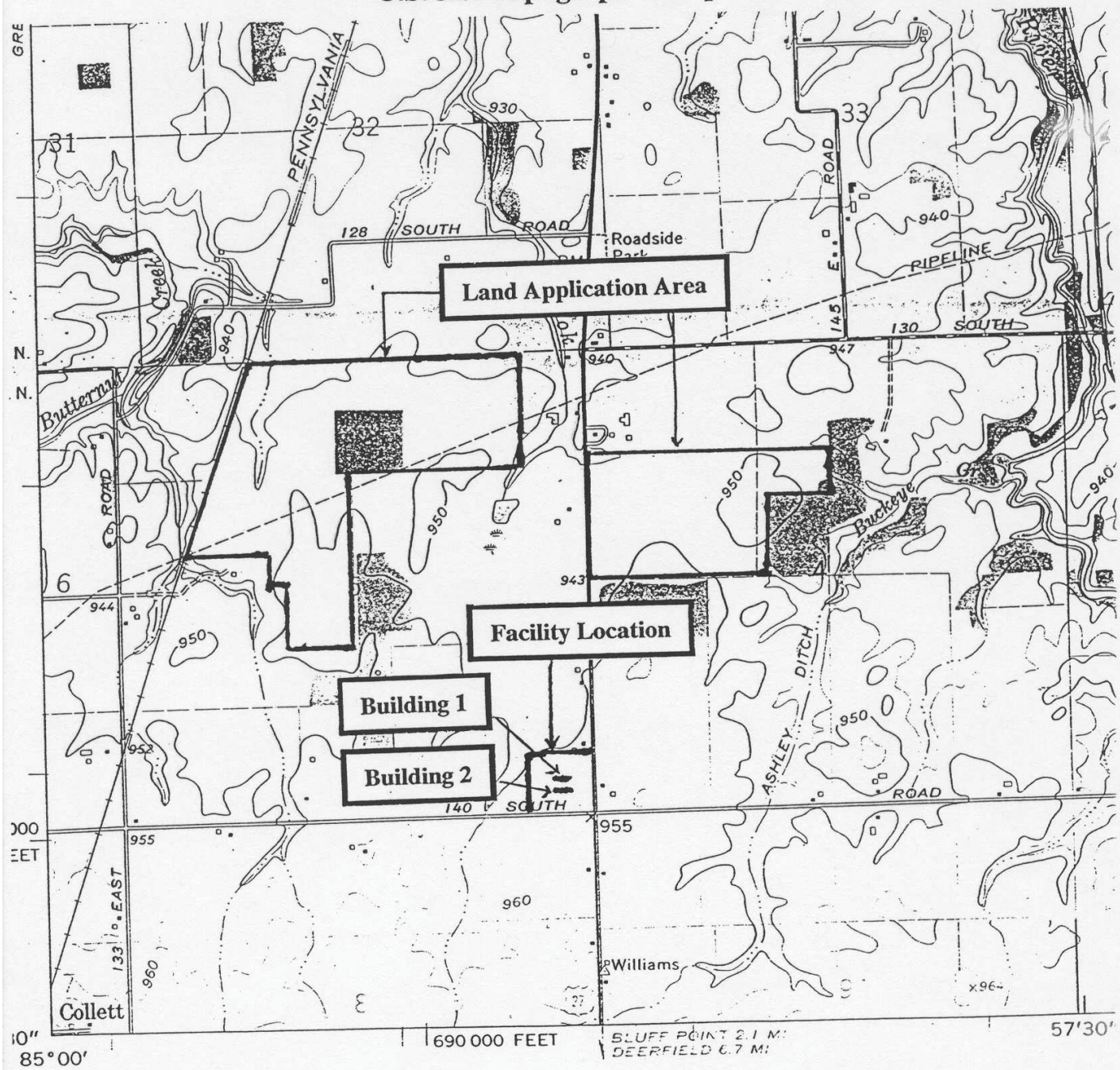
1. Approved disposal plant;
2. Burial upon the owner's premises to such a depth that every part of the animal's body is at least four (4) feet below the natural surface of the ground and every part of the animal's body is covered with at least four (4) feet of earth in addition to any other material that may be used as cover;
3. Thorough and complete incineration;
4. Composting.

IDEM coordinates activities pertaining to dead animal disposal with the Indiana State Board of Animal Health.

Appendix Contents:

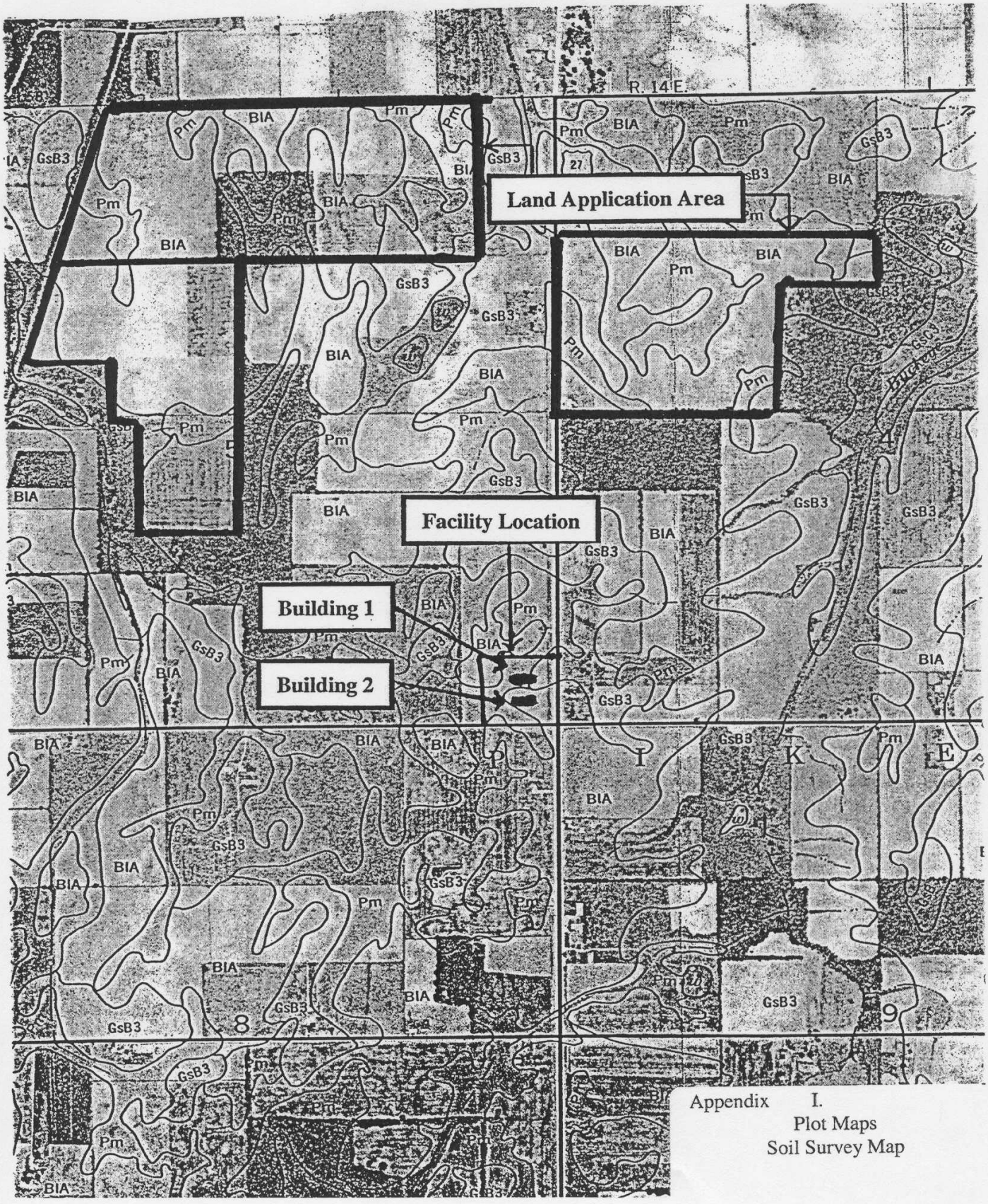
VIII. Example Plot Maps (topographic and soil maps)
IX. Example Farmstead Map
X. Example Waste Management System Drawings (seven drawings depicting a concrete tank for liquid manure)
XI. Rainfall Map
XII. Purdue Cooperative Extension Service Reference List
XIII. Natural Resource Conservation Service Reference List
XIV. Purdue Publication AY 278 "Estimating Manure Spreader Capacity"
VIII. Purdue Publication AY 277 "Calculating Manure and Manure Nutrient Application"
IX. Map of Agricultural & Solid Waste Compliance Staff (Inspectors)
X. IDEM CFO Inspection Report
XI. IDEM CFO Land Application Inspection Report
XII. IC 13-18-10, Indiana Statute on Confined Feeding Operations
XIII. Definitions that apply to the Confined Feeding Control Law

U.S.G.S. Topographic Map

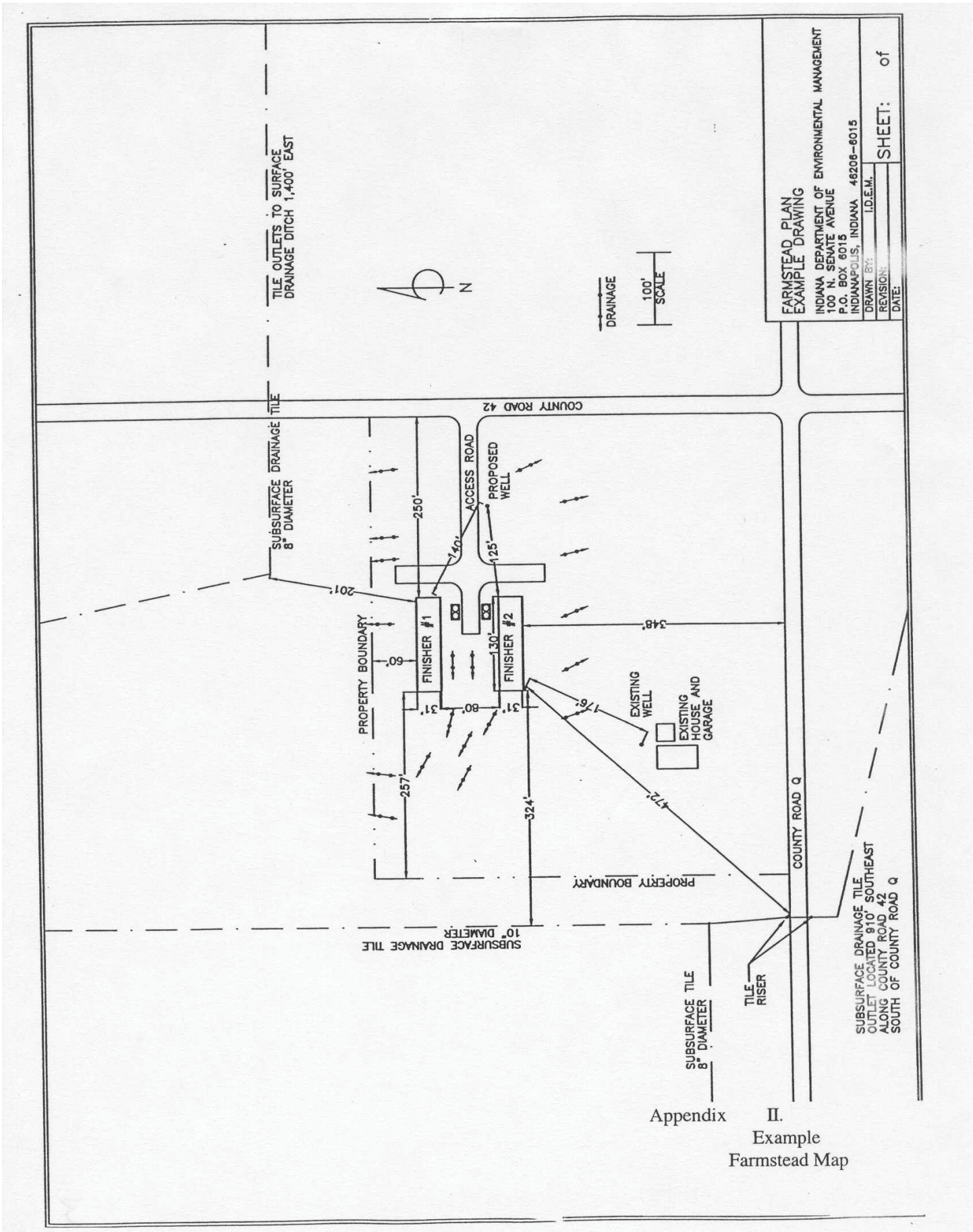


Appendix I.
Plot Maps
Topographic Map

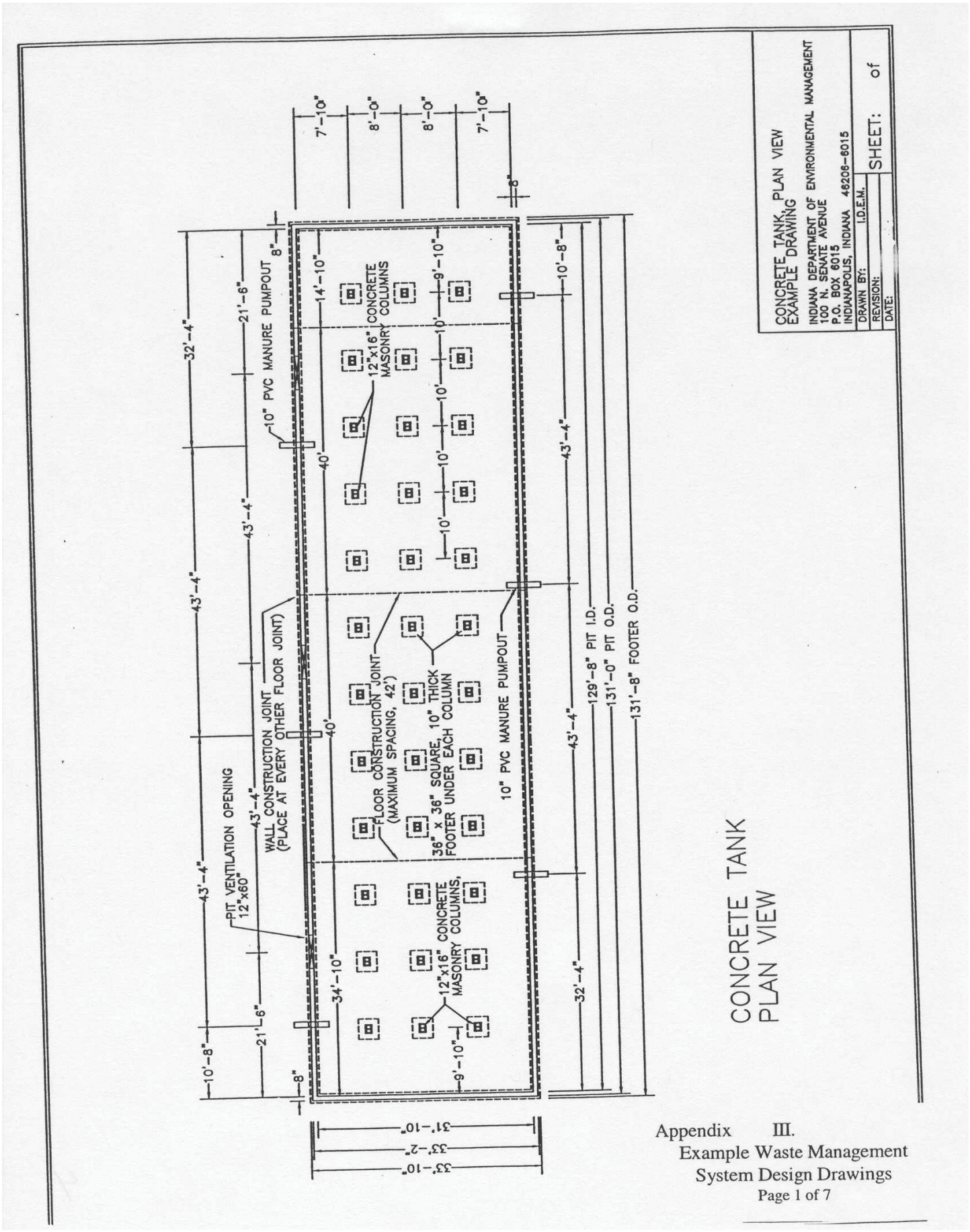
U.S.D.A. Soil Survey Map



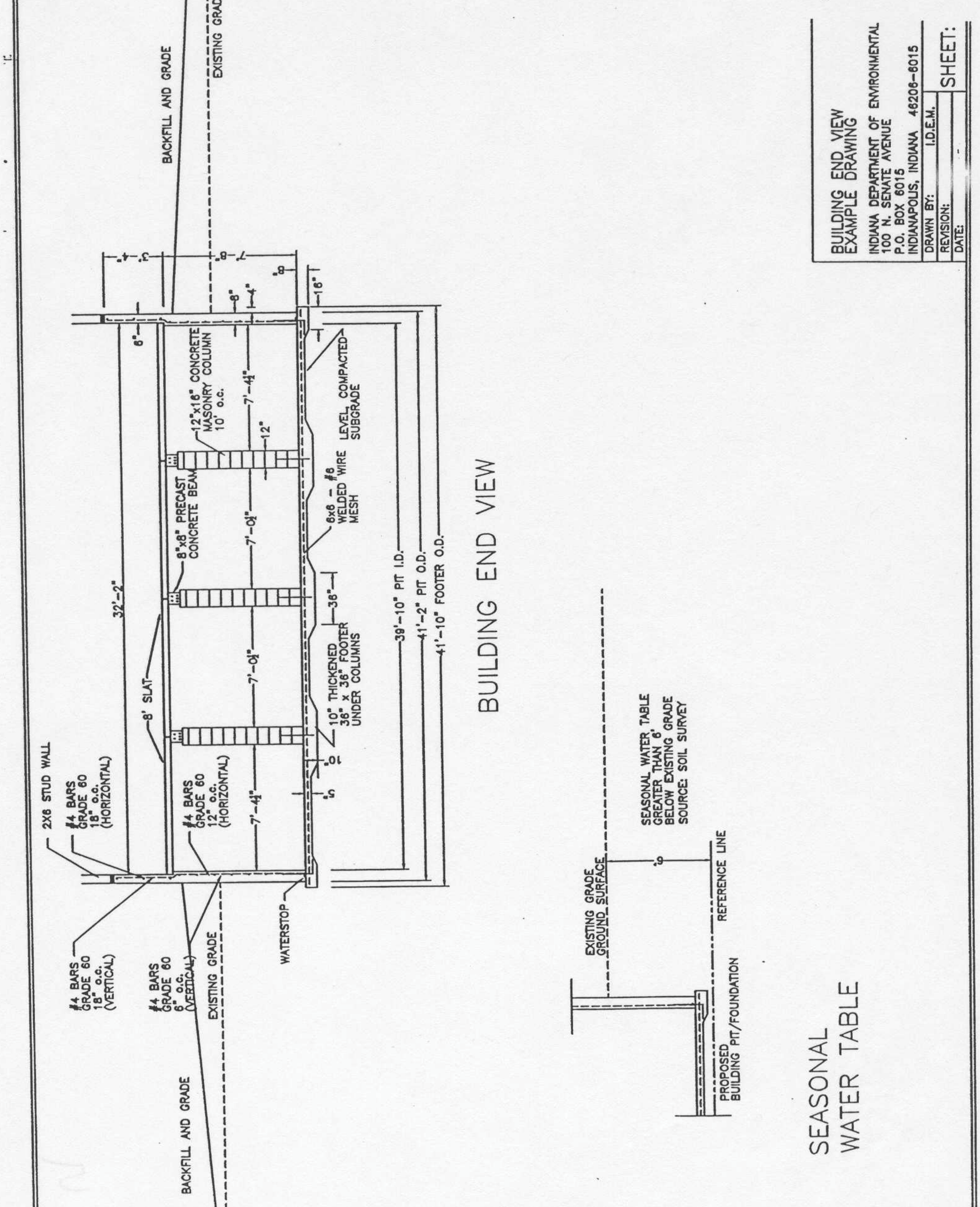
Appendix I.
Plot Maps
Soil Survey Map

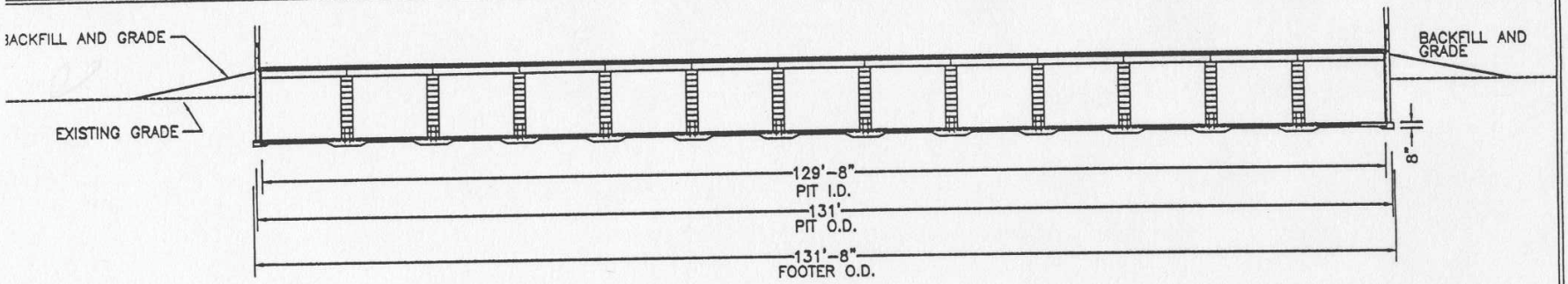


Appendix II.
Example
Farmstead Map

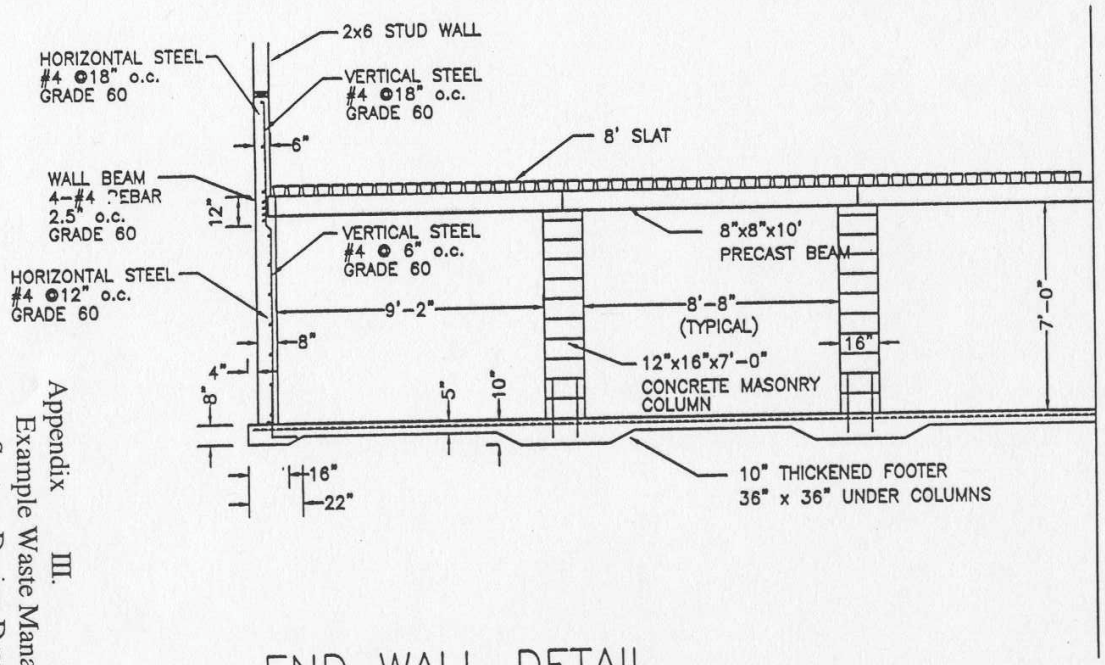


Appendix III.
Example Waste Management
System Design Drawings
Page 1 of 7


BUILDING END VIEW
EXAMPLE DRAWING
INDIANA DEPARTMENT OF ENVIRONMENTAL
100 N. SENATE AVENUE
P.O. BOX 6015
INDIANAPOLIS, INDIANA 46206-6015
DRAWN BY: I.D.E.M.
REVISION:
DATE:
SHEET:
BUILDING END VIEW
BACKFILL AND GRADE
EXISTING GRADE
2X6 STUD WALL
#4 BARS GRADE 60 18" o.c. (HORIZONTAL)
#4 BARS GRADE 60 12" o.c. (HORIZONTAL)
#4 BARS GRADE 60 18" o.c. (VERTICAL)
#4 BARS GRADE 60 6" o.c. (VERTICAL)
8' SLAT
8"x8" PRECAST CONCRETE BEAM
12"x16" CONCRETE MASONRY COLUMN 10' o.c.
32'-2"
3'-4"
7'-8"
6"
7'-4½"
7'-0½"
12"
WATERSTOP
10" THICKENED 36" x 36" FOOTER UNDER COLUMNS
36"
6x6 - #6 WELDED WIRE MESH
LEVEL, COMPACTED SUBGRADE
16"
39'-10" PIT I.D.
41'-2" PIT O.D.
41'-10" FOOTER O.D.
SEASONAL WATER TABLE
EXISTING GRADE GROUND SURFACE
SEASONAL WATER TABLE GREATER THAN 6' BELOW EXISTING GRADE SOURCE: SOIL SURVEY
REFERENCE LINE
PROPOSED BUILDING PIT/FOUNDATION



SIDE ELEVATION

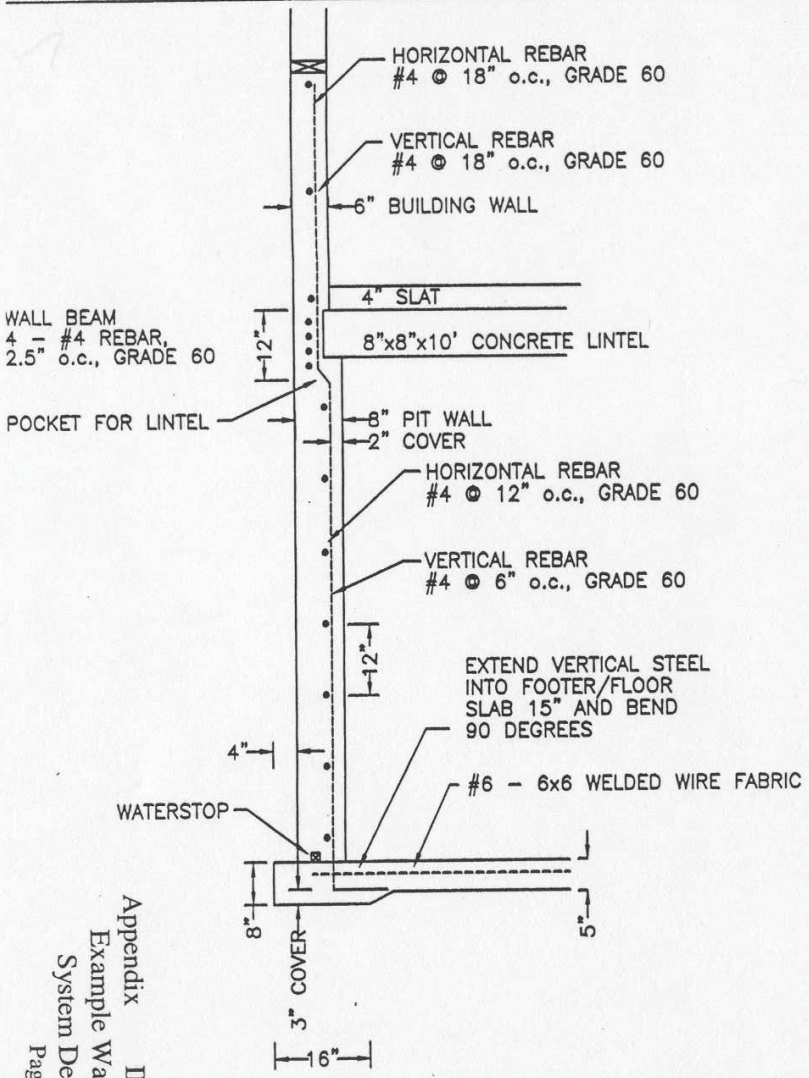


END WALL DETAIL

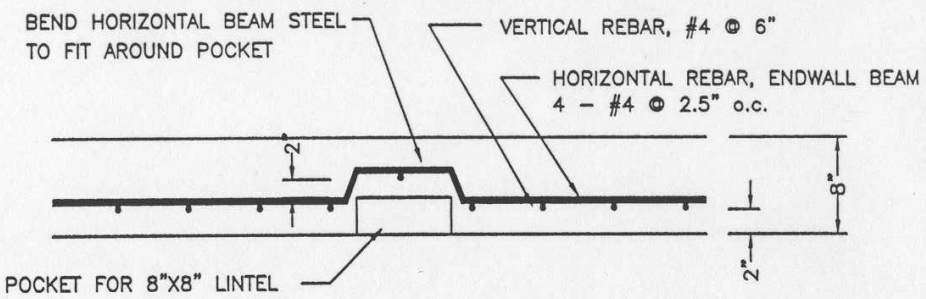
BUILDING SIDE VIEW
EXAMPLE DRAWING

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
100 N. SENATE AVENUE
P.O. BOX 6015
INDIANAPOLIS, INDIANA 46206-6015

DRAWN BY: I.D.E.M.	SHEET: of
REVISION:	
DATE:	



ENDWALL DETAIL
WITH WALL BEAM SUPPORT

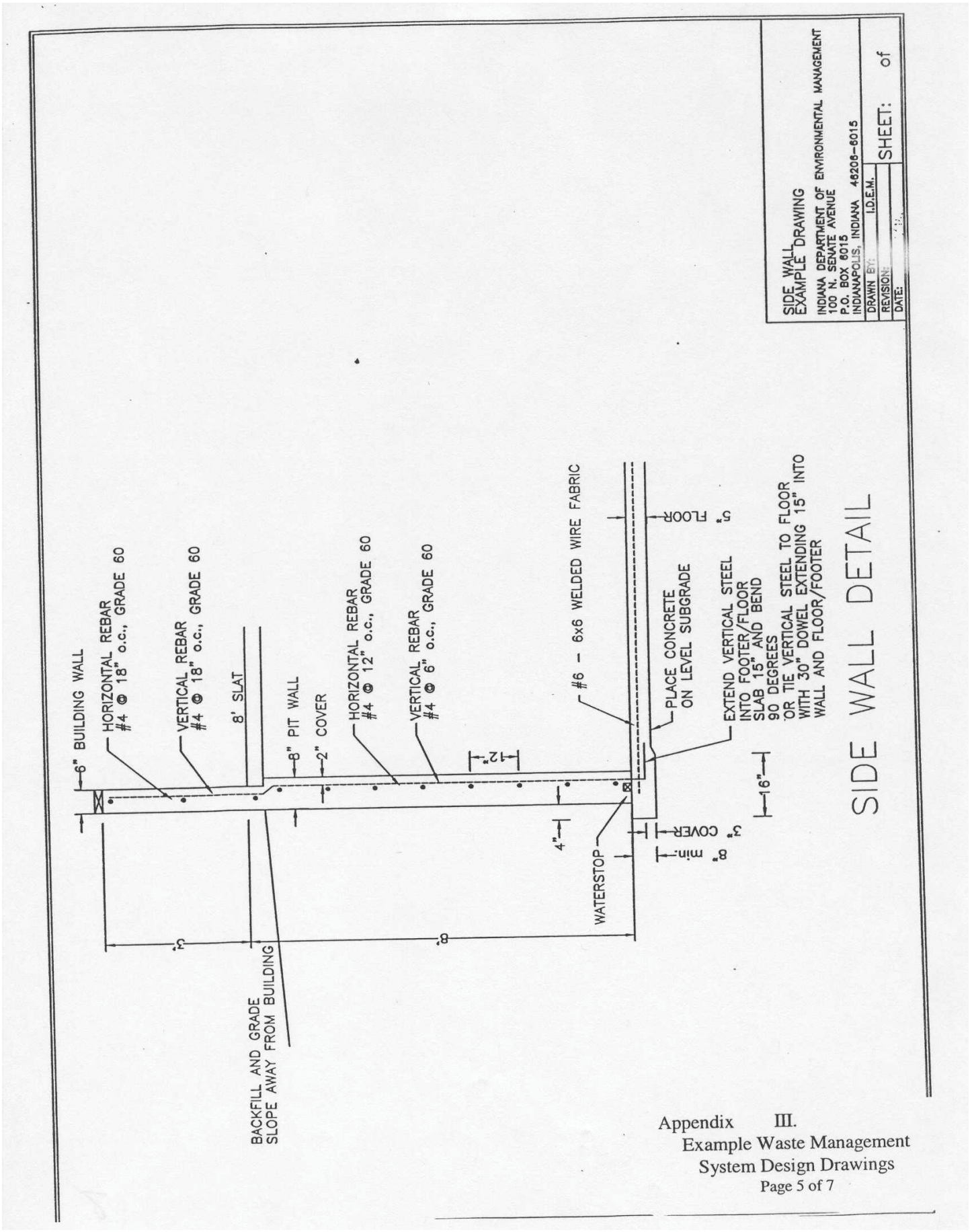


WALL BEAM SUPPORT
TOP VIEW

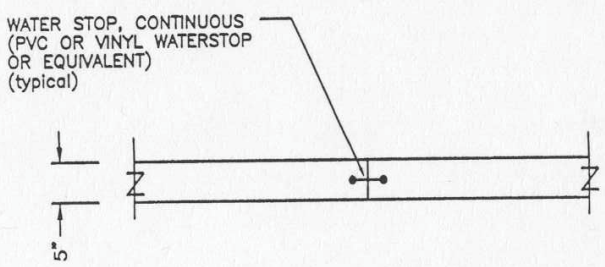
END WALL
EXAMPLE DRAWING

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
100 N. SENATE AVENUE
P.O. BOX 6015
INDIANAPOLIS, INDIANA 46206-6015

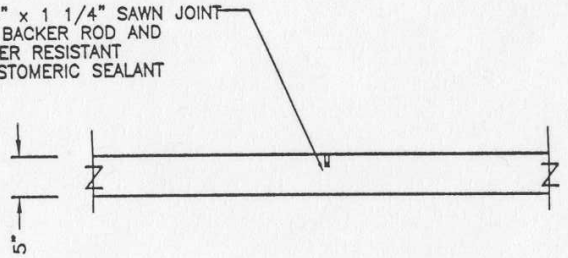
DRAWN BY: I.D.E.M.	SHEET: of
REVISION:	
DATE:	



Appendix III.
Example Waste Management
System Design Drawings
Page 5 of 7

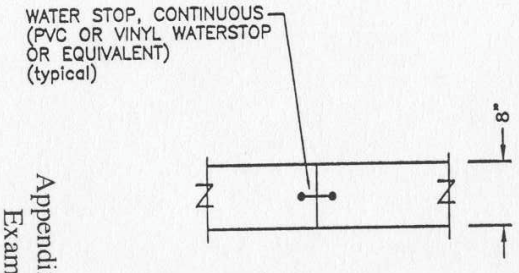


PVC OR VINYL WATER STOP



SAWN CONSTRUCTION JOINT

FLOOR CONSTRUCTION JOINT
SECTION



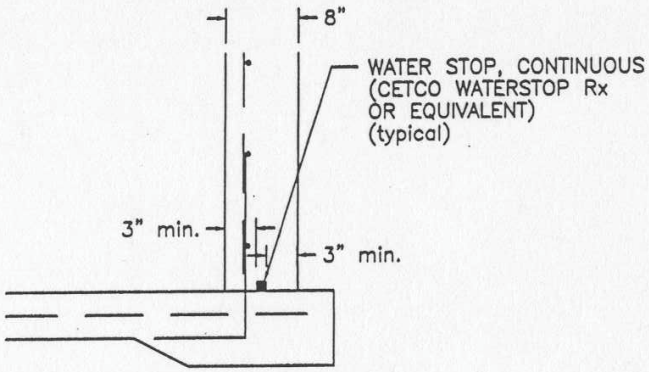
PVC OR VINYL WATER STOP

WALL CONSTRUCTION JOINT
TOP VIEW

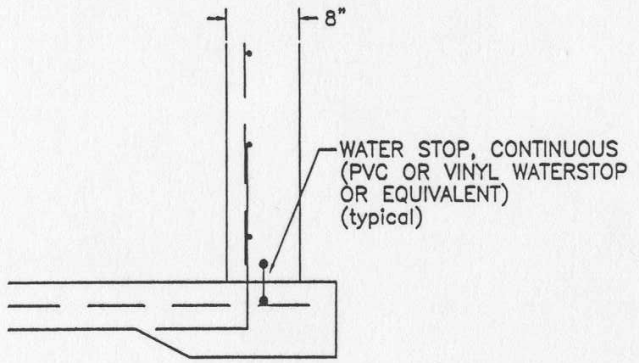
CONSTRUCTION JOINTS
EXAMPLE DRAWING

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
100 N. SENATE AVENUE
P.O. BOX 6015
INDIANAPOLIS, INDIANA 46206-6015

DRAWN BY: I.D.E.M.	SHEET: of
REVISION:	
DATE:	

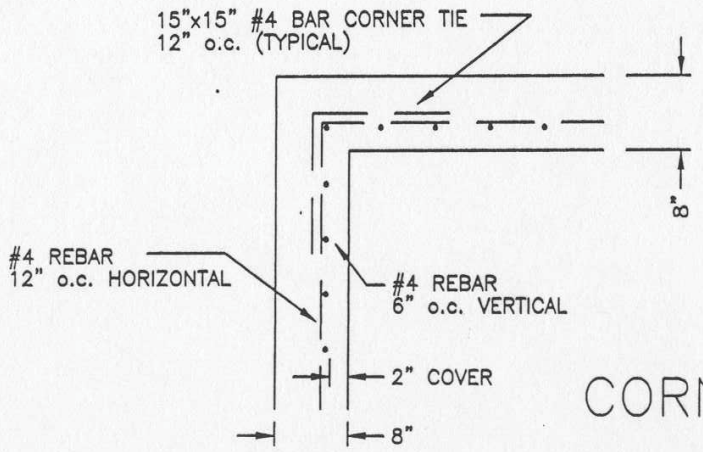


COLLODIAL WATER STOP
(OPTION A)



PVC OR VINYL WATER STOP
(OPTION B)

WALL/FOOTER DETAIL
SECTION



CORNER DETAIL

WATERSTOP DETAILS
CORNER DETAIL
EXAMPLE DRAWING
INDIANA DEPARTMENT OF ENVIRONMENTAL
100 N. SENATE AVENUE
P.O. BOX 6015
INDIANAPOLIS, INDIANA 46206-6015

DRAWN BY:	I.D.E.M.	SHEET:
REVISION:		
DATE:		

Appendix IV.
Rainfall Map

MANURE MANAGEMENT
AND WASTE UTILIZATION
REFERENCE & WEBSITE LIST

NATURAL RESOURCES CONSERVATION SERVICE

Agricultural Waste Management Field Handbook (AWMFH) – Part 651, "National Engineering Handbook", April 1992 http://www.ftw.nrcs.usda.gov/awmfh.html
Field Office Technical Guide (FOTG)
Soil Quality Institute - Fact Sheets
RCA Issue Brief 7 – Animal Manure Management (12/95)

PURDUE PUBLICATIONS

Purdue Extension Publications Online http://www.agcom.purdue.edu/AgCom/Pubs/menu.htm
AY 277 Calculating Manure and Manure Nutrient Application Rates (8/93)
http://www.agcom.purdue.edu/AgCom/Pubs/AY/AY-277.html
AY 278 Estimating Manure Spreader Capacity (9/93)
http://www.agcom.purdue.edu/AgCom/Pubs/AY/AY-278.html
AY-281 Soil Sampling for P, K and Lime Recommendations (2/95)
http://www.agcom.purdue.edu/AgCom/Pubs/AY/AY-281.html
AY-9-32 Tri-State Fertilizer Recommendations for Corn, Soybeans, Wheat & Alfalfa
http://www.agcom.purdue.edu/AgCom/Pubs/AY/AY-9-32.pdf
CES 227 How and Where to Get a Livestock Manure Analysis (5/90)
FF-2 Livestock Manure Can Reduce Fertilizer Costs
http://www.anr.ces.purdue.edu/Chart/docs/FF2.pdf
FF-33 Total Farm Nutrient Mgmt – A Practical Approach for Swine Producers (2/99)
http://www.anr.ces.purdue.edu/Chart/docs/FF33.pdf
FF-34 Best Management Practices (BMPs) to Efficiently Use Swine Manure as Fertilizer
Swine: Pork Industry Handbook - Manure (Waste) Management
http://www.agcom.purdue.edu/AgCom/Pubs/ansci.htm - 15
ID-101 Animal Manure as a Plant Nutrient Resource (5/94)
http://www.agcom.purdue.edu/AgCom/Pubs/ID/ID-101.html
ID-205 Swine Manure Management Planning (6/94)
http://www.agcom.purdue.edu/AgCom/Pubs/ID/ID-205.html
ID-206 Poultry Manure Management Planning (9/94)
http://www.agcom.purdue.edu/AgCom/Pubs/ID/ID-206.html
ID-208 Dairy Manure Management Planning (7/95)
http://www.agcom.purdue.edu/AgCom/Pubs/ID/ID-208.html
P-99 Poultry Manure's Fertilizer Value
WQ-7 Animal Agriculture's Effect on Water Quality - Pastures and Feedlots (7/90)
http://www.agcom.purdue.edu/AgCom/Pubs/WQ/WQ-7.html
WQ-8 Animal Agriculture's Effect on Water Quality - Waste Storage (6/93)
http://www.agcom.purdue.edu/AgCom/Pubs/WQ/WQ-8.html
WQ-16 Land Application of Manure (12/92)
http://www.agcom.purdue.edu/AgCom/Pubs/WQ/WQ-16.html
WQ-22 Farm-A-Syst, Indiana Farmstead Assessment
http://www.ecn.purdue.edu/SafeWater/farmasyst/index.htm
AI-10 Animal Issues – Total Farm Nutrient Management – Waste Utilization
http://www.anr.ces.purdue.edu/anissue/ai10.pdf

AI –9 Animal Issues – Total Farm Nutrient Management – Manure Treatment
http://www.anr.ces.purdue.edu/anissue/ai9.pdf

OTHER INFORMATION/PUBLICATIONS

MWPS-18 Livestock Waste Facilities Handbook (4/97)
NRAES-54 On-Farm Composting Handbook (6/92)
Indiana Confined Feeding Rule, Indiana Department of Environmental Management
PM-1609 You Can't Afford Not to Haul Manure, Iowa State University Extension (2/95)
Poultry Water Quality Consortium (PWQC)
http://www.poultryegg.org/other/index.htm - Poultry Water Quality Consortium
Poultry Water Quality Handbook – 2nd Edition (9/98) (See PWQC website above)

WEBSITES

NRCS

NRCS National Nutrient Management Homepage – Lists On-line Nutrient Management Tools, Other Nutrient Management Tools, Documents and Technical References, Databases, Links to Other Nutrient Homepages
http://www.nhq.nrcs.usda.gov/BCS/nutri/manage.html

Draft of Unified National Strategy for AFO's, (USDA & EPA) 11 Sep 98
http://www.nhq.nrcs.usda.gov/cleanwater/afo/

Manure nutrients available vs. crop needs:
http://www.nhq.nrcs.usda.gov/land/pubs/nlweb.html

NRCS homepage
http://www.nrcs.usda.gov/

NRCS Technical Resources
http://www.nrcs.usda.gov/TechRes.html

NRCS Technical Tools including a Manure Decision system
http://www.ncg.nrcs.usda.gov/tech_tools.html

Purdue University Extension

Purdue Agronomy's Software Home Page - Manure Management Planner – Dr. Brad Joern's Computer Program, WinMax2 – MAX Recordkeeping Program
http://www.agry.purdue.edu/software

Purdue Livestock Page
http://www.anr.ces.purdue.edu/anr/livestoc.html

Purdue Pork Page (lists Publications and other links)
http://www.anr.ces.purdue.edu/anr/anr/swine/porkpage.htm

Purdue Pork Page – Manure Management
http://www.anr.ces.purdue.edu/anr/anr/swine/manure/manure.htm

Purdue Extension Publications
http://www.agcom.purdue.edu/AgCom/Pubs/menu.htm

Other University Extension Information and Publications

Iowa State University – Iowa Manure Management Action Group
http://extension.agron.iastate.edu/immag/

Michigan Manure Resources Network – Michigan State University Extension
http://web2.canr.msu.edu/manure/

University of Minnesota – Manure Resources List
http://www.bae.umn.edu/extens/manure/manure.html

Nebraska Waste Management
http://www.ianr.unl.edu/pubs/wastemgt/index.htm

North Carolina
http://www.bae.ncsu.edu/programs/extension/proindex.html
http://www.ces.ncsu.edu/resources/water/
http://harnett.ces.state.nc.us/agriculture.html

NPS Decision support system [Penn State]
http://h2osparc.wq.ncsu.edu/

The Ohio State University
http://www.ag.ohio-state.edu/~ohioline/b604

Other Sources

Agricultural Research Services (ARS) National Program - Manure & Byproduct Utilization
http://www.nps.ars.usda.gov/programs/programs.htm?NPNUMBER=206

Natural Resource, Agriculture and Engineering Service
http://www.nraes.org/publications/waste.html

Quality Pork Production
http://www.nppc.org/PROD/EnvironmentalSection/envguide7.html

Everything You Need to Know about Manure
http://www.pucksfarm.com/mans.htm

Biosolids Worksheet
http://web.css.orst.edu/news/publicat/sullivan/index.htm

Manure and Nutrient Management
http://www.gov.on.ca/OMAFRA/english/livestock/swine/facts/94-097.htm

EPA-NPS
http://www.epa.gov/OWOW/NPS/npsie.html

EPA-Michael Cook
http://www.epa.gov/owmitnet/5-13-98.htm
EPA-AFO's
http://www.epa.gov/owmitnet/afo.htm

Water Quality Info
http://h2osparc.wq.ncsu.edu/info/index.html

Bioenergy List SPONSORS and ARCHIVES:
http://solstice.crest.org/renewables/bioenergy-list-archive/

Manure Handling Companies

A.O. Smith Corporation – Slurrystore Systems (Storage structure)
http://www.slurrystore.com

Balzer Inc – Spreaders, handling systems
http://www.balzerinc.com/

Hydro-Engineering, Inc – Injectors, Drag hoses, pumps
http://www.hydro-eng.com

Top Air Manufacturing – Better Bilt Spreaders, Injectors, and hauling systems
http://www.topairmfg.com

(See University of Minnesota – Manure and Odor Education and Research – Vendors for Manure Products http://www.bae.umn.edu/extens/manure/vendors/index.htm). This site has many Manure Handling and Odor Control Companies)

Manure Testing Laboratories

Laboratory	**Services Provided**
A&L Analytical Labs 411 N. Third St. Memphis, TN 38105 901-527-2780 Fax: 219-546-2606 rlarge@allabs.com www.allabs.com	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N ✓ Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis
A&L Great Lakes Labs, Inc. 3505 Conestoga Dr. Ft. Wayne, IN 46808 219-483-4759 Fax: 219-483-5274 lab@algreatlakes.com algreatlakes.com/main.asp	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N ✓ Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis

Agri Labs 405 Buck Rd. Coldwater, MI 49036 517-238-2445 (MI) 219-546-2606 (IN) Fax: 517-238-2445 daw@voyager.net	Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium Nitrate N Carbon-to-Nitrogen Ratio Sludge Analysis ✓ Total solids Waste Water Analysis
Brookside Labs 308 South Main St. New Knoxville, OH 45871 419-753-2448 Fax: 419-753-2949 greg@blinc.com www.blinc.com	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N ✓ Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis
Central States Analytic, Inc. 2406 Lynch Rd. Evansville, IN 47711 812-424-0667 Fax: 812-424-0667 csastl@aol.com	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N ✓ Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis
Chemical Service Lab 3303 Industrial Parkway Jeffersonville, IN 47130 812-280-1090 Fax: 812-280-1094	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis
Edglo Labs 2121 E. Washington Blvd Ft. Wayne, IN 46803 219-424-1622 Fax: 219-424-9124 bowyer@edglo.com www.edglo.com	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N ✓ Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis

Environmental Consulting 635 Green Rd. PO Box 968 Madison, IN 47250 Lab: 812-273-6699 Office: 317-299-2469 Fax: 317-299-2437 lwebb@indy.net	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N ✓ Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis
Holmes Lab 3559 US Rt. 62 Millersburg, OH 44654-8834 800-344-1101 Fax: 330-893-3094 holmeslab@vallyrie.net www.holmeslab.com	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium Nitrate N Carbon-to-Nitrogen Ratio Sludge Analysis ✓ Total solids Waste Water Analysis
Iowa Testing Labs, Inc. Hiway 17 North P.O. Box 188 Eagle Grove, IA 50533 1-800-274-7645 Fax 515-448-3402 itl_lab@netins.net www.iowatestinglabs.com	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis
Midwest Labs 13611 B St. Omaha, NE 68144 402-334-7770 Fax: 402-334-9121 debeor@midwestlabs.com www.midwestlabs.com	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N ✓ Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis
Mowers Soil Testing Plus, Inc. 117 E. Main St. Box 518 Toulon, IL 61483 309-286-2761 Fax: 309-286-6251 mowers@mowersplus.com www.mowersplus.com	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N ✓ Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis

Servi-Tech Labs 1602 Park West Dr. Hastings, NE 68901 402-463-3522 Fax: 402-463-8132 brians@servi-techinc.com richardb@servi-techinc.com www.servi-techinc.com	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N ✓ Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids (dry matter only) ✓ Waste Water Analysis
Servi-Tech Labs 1816 Wyatt Earp Dodge City, KS 47801 316-227-7123. Fax: 316-227-2047 randyr@servi-techinc.com dougc@servi-techinc.com www.servi-techinc.com	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N ✓ Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis
Sherry Labs 629 Washington St. Suite 300 Columbus, IN 47202 812-375-0531 Fax: 812-375-0731 paulg@columbus.sherrylab.com www.sherrylabs.com	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N ✓ Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis
Sherry Labs 2203 S. Madison St. Muncie, IN 47302 765-747-9000 Fax: 765-747-0228 stan@sherrylabs.com www.sherrylabs.com	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis
Spectrum Analytic, Inc. 1087 Jamison Rd., NW Washington C.H., OH 43160 800-321-1562 Fax: 740-335-1104 vernon@spectrumanalytic.com www.spectrumanalytic.com	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N ✓ Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis

STL Labs 2400 Cumberland Dr. Valparaiso, IN 46383 219-646-2389 Fax: 219-462-2953 dmcevoy@stl-inc.com www.stl-inc.com	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N ✓ Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis
Sure Tech Labs 2435 Kentucky Ave. Indianapolis, IN 46221 317-243-1505 Fax: 317-243-1509 pshoga@landolakes.com	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N ✓ Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis
University of Wisconsin 8396 Yellowstone Dr. Marshfield, WI 54449 715-387-2523 x4 Fax: 715-387-1723 jbpeter1@facstaff.wisc.edu	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N ✓ Carbon-to-Nitrogen Ratio ✓ Sludge Analysis ✓ Total solids ✓ Waste Water Analysis
Valley Environmental Testing Corp. 55 N. 1st St. Terre Haute, IN 47808 812-234-0838 Fax: 812-234-3219 vetesting@ticz.com	✓ Provides Sampling Containers ✓ Nitrogen, Phosphorus, Potassium ✓ Nitrate N ✓ Carbon-to-Nitrogen Ratio Sludge Analysis ✓ Total solids ✓ Waste Water Analysis

This list of manure testing labs was up to date as of April 1, 2001 to the best of our knowledge. If you know of any others that could be added, please contact Dr. Todd Applegate and we will be glad to add them to our list. Listing of laboratories on this site is not intended to be an endorsement by Purdue University.

CERTIFIED LABORATORIES

A&L Great Lakes Lab, Inc.
3505 Conestoga Drive
Fort Wayne, IN 46808
219/483-4759

Ag Soil Management
209 S. Dunlap, P.O. Box 266
Savoy, IL 61874

Agri Labs., Inc.
405 Buck Rd.
Coldwater, MI 49036
517/238-4116

Brookside Farms Lab
308 S. Main St.
New Knoxville, OH 45877
419/753-2448

Cal Mar Soil Testing Lab
130 S. State St.
Westerville, OH 43081
614/523-1005

Land O Lakes Inc.
Sure Tech Labs
2435 Kentucky Ave.
Indianapolis, IN 46221
800/562-2622

Ingrams Soil Testing Center
P.O. Box 553, 924 W. Monroe
Sullivan, IL 61951
217/728-7413

Waters Agricultural Labs
257 Newton Hwy, P.O. Box 382
Camilla, GA 31730

Midwest Laboratories Inc.
13611 B. St.
Omaha, NE 68144
402/334-7770

Spectrum Analytic Inc.
P.O. Box 639, 1087 Jamison
Washington C.H., OH 43160
614/335-1562

Belmond Labs
R.R. 2, Box 203
Belmond, IA 50421
515/444-3384

CLC Labs
325 Venture Drive
Westerville, OH 43081
614/888-1663

Chemical Service Lab.,Inc.
3303 Industrial Parkway
Jeffersonville, IN 47130
812/280-1090

Mowers Soil Testing Plus, Inc.
Box 158, 117 E. Main St.
Toulon, IL 61483
309/286-2761

United Soils, Inc.
111 S. Crystal Lane
Fairbury, IL 61739
815/692-2626

Southern Illinois Soil Lab
P.O. Box 448
Hamel, IL 62046
LIMING ONLY

This list is meant only as a reference tool and current as of 1/16/01. Many of the websites listed, especially the various Cooperative Extension Service sites, have related publications and websites. This reference list does not constitute an endorsement or recommendation of the products, research or companies listed.

USDA NRCS Natural Resources Conservation Service

NRCS FIELD OFFICE TECHNICAL GUIDE

The Field Office Technical Guide (FOTG) is one of the most important tools used by the Natural Resources Conservation Service (NRCS) field office staffs in carrying out the conservation programs of the agency.

The FOTG is an integral part of conservation planning. It is used with the NRCS National Planning Procedures Handbook (NPPH), which contains policies and procedures for providing decision-makers with technical assistance for all NRCS programs.

The guide represents the latest conservation treatment technology. It helps NRCS decision-makers identify resource problems, evaluate the effects of conservation treatments, compare alternatives, and select the best options to meet conservation needs and objectives.

NRCS's Field Office Technical Guide is a dynamic document that continually changes to incorporate new technology and experience.

To update the Guide, NRCS relies heavily on input from universities and experiment stations, NRCS plant materials centers, the U.S. Department of Agricultural Research Service and Extension Service, the U.S. Environmental Protection Agency, and other Federal and state agencies. NRCS works closely with these groups to apply new technology to NRCS programs.

The FOTG was developed mainly for NRCS use. It is however, a public document that is available to states; other Federal agencies; and urban planners, developers, and consultants who are interested in applying effective conservation measures.

At first glance, the FOTG appears to be the same in one field office as it is in another. Actually, the information inside applies specifically to the unique combination of resources in each individual field office area.

Section I General References

Section I of the FOTG contains general references to help NRCS conservationists understand all the physical, legal, and other factors affecting conservation in the area so that good decisions about the use of natural resources and conservation management systems can be made. The laws, ordinances, regulations, maps, costs, resources, erosion predictions, and climatic and cultural data included in this section deal with agronomy, biology, forestry, soils, engineering, and economics.

Section II Soil and Site Information

In section II, soils specific to the field office area are described. Information about their limitations, sustainability, and potential for rural and urban land uses, in respect to erosion control, water management,

construction materials, sanitary facilities, building site development, wildlife habitat, recreational development, windbreaks and environmental plantings, and woodland management and productivity, is included.

Section III Conservation Management Systems

Section III has guidelines for developing conservation management systems that combine sound, practical, effective conservation practices and management measures that fit local field conditions. This section describes the considerations that must be addressed to solve resource problems using the best available technology.

Section IV Practice Standards and Specifications

Section IV describes the standards and specifications for applying selected conservation practices, such as grassed waterways, ponds, planned grazing systems, and buffers.

Section V Conservation Effects

Section V contains information regarding the environmental social, cultural, and economic effects of installing and maintaining conservation practices.

I. General References | II. Soil and Site Information | III. Conservation Management Systems | IV. Practice Standards and Specifications | V. Conservation Effects

The Field Office Technical Guide is the focus of NRCS technical expertise in agronomy, biology, ecology, economics, engineering, forestry, geology, sociology, and soil science. It plays a key role in helping decision makers use the best technology available to apply conservation treatments that will ensure, for the benefit of future generations, the prudent management of our Nation's soil, water, air, and related plant and animal resources.

HOME

Code	Practice Name	Issue Date
560	Access Road	Jun-89
310	Bedding	Jun-89
741	Buffer Strip (Interim)	Mar-98
326	Clearing & Snagging	Jun-89
360	Closure of Waste Impoundments	Sep-00
397	Commercial Fishponds	Sep-81
317	Composting Facility	Jul-95
327	Conservation Cover	Nov-88
328	Conservation Crop Rotation	Nov-90
332	Contour Buffer Strips	Dec-97
330	Contour Farming	Aug-81
340	Cover & Green Manure Crop	Apr-84
342	Critical Area Planting	Sep-95
589B	Cross Wind Stripcropping	Nov-81
402	Dam, Floodwater Retarding	Jun-90
349	Dam, Multiple-Purpose	Jun-90
356	Dike	Nov-89
362	Diversion	Jun-89
712	Drafting Basins (Interim)	Jan-96
432	Dry Hydrants	Jun-99
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382	Fence	Jun-00
386	Field Border	Jun-00
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393	Filter Strip	Apr-00
394	Firebreak	Apr-99
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399	Fishpond Management	Mar-85
400	Floodwater Diversion	Jun-90
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412	Grassed Waterway	Nov-00
561	Heavy Use Area Protection	Feb-82
422	Hedgerow Planting Dec-92	
552A	Irrigation Pit or Regulating Reservoir, Irrigation Pit	Jun-90
552B	Irrigation Pit or Regulating Reservoir, Regulating Reservoir	Jun-90
436	Irrigation Storage Reservoir	Jun-90
442	Irrigation System, Sprinkler	May-88
443	Irrigation System, Surface & Subsurface	Sep-82
441	Irrigation System, Trickle	May-88
430AA	Irrigation Water Conveyance, Pipeline, Aluminum Tubing	Nov-79
430DD	Irrigation Water Conveyance, High Pressure, Underground, Plastic Pipeline	Jun-89
430EE	Irrigation Water Conveyance, Low Pressure, Underground, Plastic Pipeline	Jun-89
449	Irrigation Water Management	Jul-00
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456	Land Reclamation, Highwall Treatment	Jul-80
453	Land Reclamation, Landslide Treatment	Jul-80
454	Land Reclamation, Subsidence Treatment	Jul-80

455	Land Reclamation, Toxic Discharge Control	Jul-80
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Agronomy Guide

Purdue University Cooperative Extension Service

SOILS AY-278

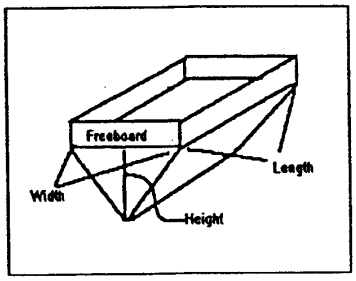
Estimating Manure Spreader Capacity

Brad C. Joern and Sarah L. Brichford
Department of Agronomy

Good manure management is an essential skill for today's livestock producer. Proper storage, handling, and land application of manure is necessary to utilize manure nutrients for crop production and avoid problems with environmental contamination. Developing a strategy for land application of manure begins with knowing the amount of manure contained in a spreader load. With this information and a laboratory analysis of your livestock manure, you can caculate the application rate of both the manure and the manure nutrients (N, P, and K) on a per acre basis. This publication describes how to estimate the capacity of three types of manure spreaders: liquid tank, V-bottom, and box. A separate publication, AY-277, contains instructions for obtaining a manure sample and worksheets for calculating manure application rates ***after*** you have estimated manure spreader capacity.

Estimating manure spreader capacity is a simple procedure. Your owner's manual should provide information regarding the size or capacity of the spreader. If this information is not available, use the following formulas to calculate capacity. Simply make the necessary measurements for your spreader type and use these values in the formula given.

V-bottom Type



V-bottom spreaders can hold either semi-solid (gallons) or solid manure (tons). If you do not have the capacity of your spreader, you will have to make three measurements.

1. Measure the length and width (in feet) of the manure spreader box. Then, measure the height from the bottom of the spreader box to the top of the manure load.

2. Insert these values into the following formula:

Length (ft.) x Width (ft.) x Height (ft.) x 0.016 = Capacity in tons

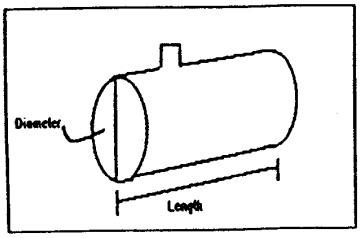
Length (ft.) x Width (ft.) x Height (ft.) x 3.75 = Capacity in gallons

Your spreader:

Solid _____ (ft.) x _____ (ft.) x _____ (ft.) x 0.016 = _____ tons

Liquid _____ (ft.) x _____ (ft.) x _____ (ft.) x 3.75 = _____ gallons

Liquid Tank Type



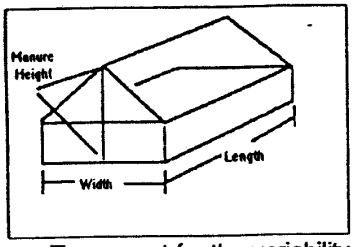
The capacity of a liquid tank spreader is the easiest to calculate. The capacity is often painted on the side of the tank. If capacity information is not available, use the following steps to calculate the capacity (in gallons) of your spreader.

1. Measure the length and diameter of the tank (in feet) as shown in the diagram.
2. Insert these values into the following formula:

[Diameter (ft.)/2]^2 x Length (ft.) x 23.6 = Capacity in gallons

Your spreader: $\left[\frac{\text{\_\_\_\_ ft.}}{2}\right]^2$ **x** _____ **ft. x 23.6 =** _____ **gallons**

Box Type



The capacity of a box spreader is difficult to estimate accurately because the density of solid manure is quite variable. Density is the weight of the manure per volume of manure (e.g., lb./ft.^{3}). Manure density varies depending on the amount of bedding used. Therefore, if you estimate spreader capacity as only the volume of manure the spreader holds you are overlooking the fact that some manure weighs more than other manure. This can cause a significant error when calculating manure application rates.

To account for the variability in manure density, we recommend weighing five, full spreader loads and then calculating the average weight of a full spreader. This is the preferred method and will give you a reasonable estimate of spreader capacity.

1. Weigh five different spreader loads, using drive-on scales or portable truck scales,* and calculate the average weight. Remember, one ton equals 2000 pounds.

Load 1 _____ + Load 2 _____ + Load 3 _____ + Load 4 _____ + Load 5 _____ = Total Weight (tons)

Total Weight _____ / 5 = Average Loaded Weight _____ tons

2. Weigh the spreader when it is empty, and subtract this value from the average loaded weight. The resulting value is the manure holding capacity.

Average Loaded Weight _____ - Empty Spreader Weight _____ = _____ tons

*If you do not have access to scales you can calculate spreader volume by measuring three dimensions of the spreader. Keep in mind that this method is much less accurate than weighing.

1. Measure the length and width of the manure spreader box (in feet) as shown in the diagram.

2. Fill the spreader and measure the distance from the bottom of the box to the top of the manure load. This is the manure height. Take five measurements and use the average value in the formula.

3. Insert these values into the following formula:

Length (ft.) x Width (ft.) x Manure Height (ft.) x 0.025 = Capacity in tons

Your spreader: _____ **ft. x** _____ **ft. x** _____ **ft. x 0.025 =** _____ **tons**

Editor: Cheri Janssen, Department of Agronomy NEW 9/93 (5M)

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Appendix VII.

Purdue Publication AY 278

Printed o

Agronomy Guide

Purdue University Cooperative Extension Service

SOILS AY-277

Calculating Manure and Manure Nutrient Application Rates

Brad C. Joern and Sarah L. Brichford
Department of Agronomy, Purdue University

Did you know that livestock excrete 70-80 percent of the nitrogen, 60-85 percent of the phosphorus, and 80-90 percent of the potassium fed to them? For example, if you feed 100 acres of corn to your livestock and collect all of the manure, there may be enough phosphorus and potassium to fertilize 75 acres (depending on your soil test phosphorus and potassium levels). Although the availability of manure nitrogen depends on several uncontrollable factors, the availability of manure phosphorus and potassium do not. **Most of the fertilizer value of manure comes from phosphorus and potassium, not nitrogen.** This bulletin will help you begin to manage manure as a crop nutrient resource, not a waste product.

The first step in treating animal manure as a crop fertilizer is to determine its nutrient content. Once the manure nutrient content has been established, you can calculate the proper application rate based on your management objectives, crop yield potential, and soil test values for the field(s) that will receive manure.

Determining Manure Nutrient Content

A spreader load of manure with an unknown nutrient content is like an unmarked bag or sprayer tank of fertilizer. You must first determine the nutrient content before the proper application rate can be calculated. Unlike inorganic fertilizer, manure is not a uniform product. This makes obtaining a representative manure sample very important.

Collecting a manure sample

Taking a manure sample at the time of spreading increases your chances of obtaining a representative sample. Collect samples while the storage pit is being mixed. Take samples from several spreader loads while emptying the pit and mix them together to form one composite sample. **Do not enter a pit to collect the manure sample.** Dangerous gases are present near the pit surface.

If the pit is not mixed prior to loading the spreader, consider collecting separate composite samples while the pit is being emptied. Record the depth (top third, middle third, bottom third, etc.) where the samples were taken for future reference. In pits that are not mixed, manure solids, which contain most of the phosphorus, tend to settle to the bottom.

For solid manure (daily scrape and haul, manure stack, etc.) take samples from several spreader loads and combine to form one composite sample for analysis. If you apply manure throughout the year, you may want to take samples several times during the year to see if the manure nutrient content changes.

To prepare a manure sample for shipping, fill a plastic container (approximately one quart) 2/3 full with manure, squeeze out the air in the upper third of the container (to allow for gas expansion), and seal tightly for shipping. Ship samples early in the week to avoid having them sit over the weekend. Freezing or refrigerating the samples prior to shipping helps preserve the samples during transport. **Do not place manure samples in glass containers.** Gas expansion creates pressure that can cause glass containers to explode. Many laboratories supply containers and/or detailed instructions on how to prepare and ship samples. Contact the laboratory for further information.

Obtaining a nutrient analysis

As a minimum, have manure analyzed for percent solids, total nitrogen, ammonium nitrogen (NH_4^+-N), phosphate (P_2O_5) and potash (K_2O). Once a baseline of manure nutrient information has

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West Lafayette, Indiana

been established, you probably only need to send in one or two samples per year. Have additional samples analyzed if you make significant changes in livestock feeding, watering, or housing.

With this sampling method you may be done spreading before you receive the laboratory manure nutrient analysis report. You can still credit the nutrients in manure applied after you get the test results if you know the manure application rate.

In addition to laboratory analysis, portable test kits can measure plant available manure nitrogen at the time of application. These manure test kits give a reasonable estimate of plant available nitrogen in approximately five minutes and can be used as a supplement to the laboratory analysis. If you apply manure based on nitrogen, you can use the test kit results to calculate manure nitrogen application rates. The laboratory analysis can then be used to determine phosphate and potash credits, as well as fine-tune nitrogen credits. Contact your local cooperative Extension office about the availability of manure test kits in your area.

Table 1. Nutrients in solid manure at the time of land application.*

Species	Bedding or litter	Dry matter (%)	Total NH_4^+N	N	P_2O_5	K_2O
			lb./ton manure			
Swine	no	18	6	10	9	3
	yes	18	5	8	7	7
Beef	no	15[1]	4	11	7	10
	no	52[2]	7	21	14	23
	yes	50	8	21	18	26
Dairy	no	18	4	9	4	10
	yes	21	5	9	4	10
Sheep	no	28	5	18	11	26
	yes	28	5	14	9	25
Poultry	no	45	26	33	48	34
	yes	75	36	56	45	34
	deep pit	76	44	68	64	45
Turkey	no	22	17	27	20	17
	yes	29	13	20	16	13
Horse	yes	46	4	14	4	14

[1] Open concrete lot
[2] Open dirt lot

Table 2. Nutrients in liquid manure at the time of land application.*

Species	Waste handling	Dry matter (%)	Total NH_4^+N	N	P_2O_5	K_2O
			lb./1000 gal. manure			
Swine	liquid pit	4	26	36	27	22
	lagoon[1]	1	3	4	2	4
Beef	liquid pit	11	24	40	27	34
	lagoon[1]	1	2	4	9	5
Dairy	liquid pit	8	12	24	18	29
	lagoon[1]	1	2.5	4	4	5
Veal calf	liquid pit	3	19	24	25	51
Poultry	liquid pit	13	64	80	36	96

[1] Includes lot runoff

Table 3. Amount of nitrogen mineralized or released from organic nitrogen forms in manure to plant available forms during the growing season.*

Manure type	Manure handling	Mineralization factor
Swine	Fresh	0.50
	Anaerobic liquid	0.35
	Aerobic liquid	0.30
Beef	Solid without bedding	0.35
	Solid with bedding	0.25
	Anaerobic liquid	0.30
	Aerobic liquid	0.25
Dairy	Solid without bedding	0.35
	Solid with bedding	0.25
	Anaerobic liquid	0.30
	Aerobic liquid	0.25
Sheep	Solid	0.25
Poultry	Deep pit	0.45
	Solid with litter	0.30
	Solid without litter	0.35
Horse	Solid with bedding	0.20

* Source: MWPS-18 (Midwest Planning Service) Livestock Waste Facilities Handbook

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Interpreting your laboratory analysis

Enter your manure analysis values in the table below. Use the worksheet to estimate the plant available nitrogen (PAN) in the manure. Manure type is the species and form (solid or liquid). If you have liquid manure your values should be in lb./1000 gal. If you have solid manure your values should be in lb./ton. Tables 1 and 2 provide average nutrient values for various animal species and manure storage systems. These tables show how storage structure and livestock species can affect the nutrient content of manure, but the table values are not meant as a replacement for your laboratory manure nutrient analysis.

Manure Type	Dry Matter	Total N	Ammonium N (NH_4^+-N)	PAN	P_2O_5	K_2O
	%	---------- lb./1000 gal. *or* ton----------				

Phosphorus and Potassium

Practically all of the phosphate (P_2O_5) and potash (K_2O) applied in manure is available to the crop the first year. Use your P_2O_5 and K_2O values from the laboratory manure nutrient analysis for all calculations requiring phosphate and potash.

Nitrogen

1. The amount of nitrogen available the first year (or plant available nitrogen, PAN) is a combination of all the ammonium-nitrogen (NH_4^+-N) plus that portion of the organic nitrogen that will mineralize and become available to the crop during the growing season.

   To calculate PAN, start by subtracting the NH_4^+-N value from the Total Nitrogen value as follows.

   Formula: *Total N – NH_4^+-N = Organic N*

   Your values: _____ – _____ = _____ Organic N*

2. The amount of organic nitrogen that will mineralize during the first year is the organic N calculated in step 1 multiplied by a mineralization factor. Refer to Table 3 to obtain the mineralization factor that matches your livestock operation.

   Formula: *Organic N (from step 1) x Mineralization Factor = Organic N Available First Year*

   Your values: _____ Organic N (lb. / 1000 gal. *or* lb. / ton) x _____ =

   _____ Organic N available first year (lb. / 1000 gal. *or* lb. / ton)

3. Finally, to calculate PAN, add the ammonium-nitrogen (NH_4^+-N) obtained in your manure analysis to the organic N available the first year, from step 2.

   Formula: *NH_4^+-N + Organic N Available First Year = PAN (lb. / 1000 gal. or lb. / ton)*

   Your values: _____ (lb. / 1000 gal. *or* lb. / ton) + _____ (lb. / 1000 gal. *or* lb. / ton)

   = _____ PAN (lb. / 1000 gal. *or* lb. / ton)

Write your PAN value in the manure analysis table at the top of the page.

** lb. / 1000 gal. for liquid manure; lb. / ton for solid manure*

Calculating Application Rates

Whether you want to match manure application rates with the nutrient requirements of a certain crop and yield goal or always apply a specific rate of manure, you need to calibrate your spreader. This is a simple process requiring a few measurements and calculations. The following instructions apply to the worksheets on page 5 and 6 that you can use to calculate application rates for your liquid or solid manure spreader.

Start by determining the amount of manure your spreader holds. The owner's manual should provide information on the size or capacity of your spreader. If you do not have this information, AY-278 "Estimating Manure Spreader Capacity," explains how to calculate the capacity of both liquid and solid manure spreaders. Enter your spreader capacity in the space provided at **step 1** in the appropriate worksheet (liquid manure on page 5 and solid manure on page 6).

Next (**step 2**) estimate the nutrient content of a full manure spreader. If you assign a dollar value for each nutrient, you can get a rough estimate of the economic value of a spreader load of manure. This information can help determine the distance you can afford to haul the manure.

In **step 3**, calculate the actual manure application rate in tons or thousands of gallons per acre. For this step you need to know the width of spread and the distance traveled to empty the spreader.

The final step (**step 4**) is to determine the pounds of manure nutrients applied per acre. This is simply the manure nutrient content (from the laboratory analysis table on page 3) multiplied by the manure application rate (step 3). You can make spreader adjustments or change tractor speed to modify the manure application rate to match crop nutrient needs.

Other Considerations

Obtaining a uniform manure application can be a challenge, especially with solid manure spreaders. Adjusting tractor speed and overlapping the outside edges helps to apply solid manure evenly. Incorporating surface applied manure also distributes the manure and minimizes nitrogen volatilization. When injecting manure, keep the knives clear and unplugged.

The amount of PAN (plant available nitrogen) that will actually be available to your crop is affected by application method and timing relative to crop growth. Uncontrollable environmental factors, like temperature and rainfall, also influence the availability of nitrogen. Nitrogen can be lost by leaching below the crop root zone and as a gas through a process called denitrification. The uncertain availability of manure nitrogen has led many producers to ignore the potential nutrient credits from manure applications.

Application method or time does not significantly influence phosphorus and potassium availability, making these nutrients available to crops as they are applied. Phosphate and potash attach to soil particles and generally move very little in soil; however, these nutrients can be lost with eroded soil in runoff. Preventing soil erosion helps retain all crop nutrients and protect surface water quality.

Table 4 lists short-term nitrogen-loss estimates based on the method of manure application. Generally, the availability of manure nitrogen decreases as the time between manure application and crop nitrogen uptake increases. Most of the potentially available manure nitrogen may be lost from summer or early fall applications (before soil temperature at a depth of four inches drops below 50°F), particularly with surface applied manure.

A relatively new product, the pre-sidedress nitrate soil test, can help in determining the need for additional nitrogen fertilizer in fields that have received manure. The test is most useful when manure has been broadcast (whether incorporated or not) or in fields with a long history of manure applications. Your local cooperative Extension office has information about the pre-sidedress nitrate test. **Note: manure applications based on nitrogen alone usually result in excess phosphorus and potassium in the soil. Test soils regularly to avoid excessive phosphorus and potassium build-up.**

Table 4. Nitrogen loss as ammonia within four days after land application.*

Application method	Type of waste	Nitrogen lost (%)
Broadcast	solid	15-30
	liquid	10-25
Broadcast with immediate cultivation	solid	1-5
	liquid	1-5
Knifing	liquid	0-2
Sprinkler irrigation	liquid	15-35

* Source: MWPS-18 (Midwest Planning Service) Livestock Waste Facilities Handbook

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Nutrient application rate - Liquid manure

1. Spreader Factor: Liquid manure spreaders must divide spreader capacity by 1000.

Formula:

Value from Spreader Capacity AY-278: _____ gallons ÷ 1000 = Liquid Spreader Factor

Your values:

Value from Spreader Capacity AY-278: _____ gallons ÷ 1000 = _____ **Liquid Spreader Factor**

2. Manure Nutrients per Spreader Load:

Formula:

Plant Available Manure Nutrients x Liquid Spreader Factor (listed above)
= Nutrients per Spreader Load

Your values: (from Laboratory Analysis table, page 3)

_____ lb. **N** (PAN) per 1000 gal. x _____ (Liquid Spreader Factor) = _____ **lb. PAN per load**

_____ lb. P_2O_5 per 1000 gal. x _____ (Liquid Spreader Factor) = _____ **lb. P_2O_5 per load**

_____ lb. K_2O per 1000 gal. x _____ (Liquid Spreader Factor) = _____ **lb. K_2O per load**

3. Manure Application Rate:

Formula:

$$\frac{\text{Liquid Spreader Factor} \times 43{,}560\ \text{ft.}^2/\text{acre}}{\text{Width of Spread (ft.)} \times \text{Distance Traveled (ft.)}} = \text{Thousand gal. manure applied / acre}$$

Your values:

$$\frac{\text{\_\_\_\_\_} \times 43{,}560\ \text{ft.}^2/\text{acre}}{\text{\_\_\_\_\_ width (ft.)} \times \text{\_\_\_\_ distance (ft.)}} = \text{\_\_\_\_\_ Thousand gal. manure applied / acre}$$

4. Manure Nutrient Application Rate: The manure nutrient application rate is simply the manure nutrients per 1000 gallons multiplied by the manure application rate from step 3.

Formula:

Nutrient lb. per 1000 gal. x Thousand gal. applied / acre = Nutrient lb. / acre

Your values:

_____ **N** (PAN) lb. per 1000 gal. x _____ thousand gal. applied / acre = _____ **lb. / acre**

_____ P_2O_5 lb. per 1000 gal. x _____ thousand gal. applied / acre = _____ **lb. / acre**

_____ K_2O lb. per 1000 gal. x _____ thousand gal. applied / acre = _____ **lb. / acre**

Appendix VIII.
Purdue Publication AY 277

Nutrient application rate - Solid manure

1. Spreader Capacity:

Your value (from owner's manual or Spreader Capacity AY-278): _____ **tons of manure**

2. Manure Nutrients per Spreader Load:

Formula:

Plant Available Manure Nutrients x Spreader Capacity = Nutrients per Spreader Load

Your values: (from Laboratory Analysis table, page 3)

_____ lb. **N** (PAN) per ton x _____ tons = _____ **lb. PAN per load**

_____ lb. P_2O_5 per ton x _____ tons = _____ **lb. P_2O_5 per load**

_____ lb. K_2O per ton x _____ tons = _____ **lb. K_2O per load**

3. Manure Application Rate:

Formula:

$$\frac{\text{Spreader Capacity (tons) x 43,560 ft.}^2\text{/acre}}{\text{Width of Spread (ft.) x Distance Traveled (ft.)}} = \text{Tons manure applied / acre}$$

Your values:

$$\frac{\text{\_\_\_\_ tons x 43,560 ft.}^2\text{/acre}}{\text{\_\_\_\_ width (ft.) x \_\_\_\_ distance (ft.)}} = \text{\_\_\_\_\_ Tons manure applied / acre}$$

4. Manure Nutrient Application Rate: The manure nutrient application rate is simply the manure nutrients per spreader load multiplied by the manure application rate from step 3.

Formula:

Nutrient lb. per ton x ____ Tons applied / acre = _____ Nutrient lb. / acre

Your values:

_____ **N** (PAN) lb. per ton x _____ tons applied / acre = _____ **lb. / acre**

_____ P_2O_5 lb. per ton x _____ tons applied / acre = _____ **lb. / acre**

_____ K_2O lb. per ton x _____ tons applied / acre = _____ **lb. / acre**

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Appendix VIII.
Purdue Publication AY 277

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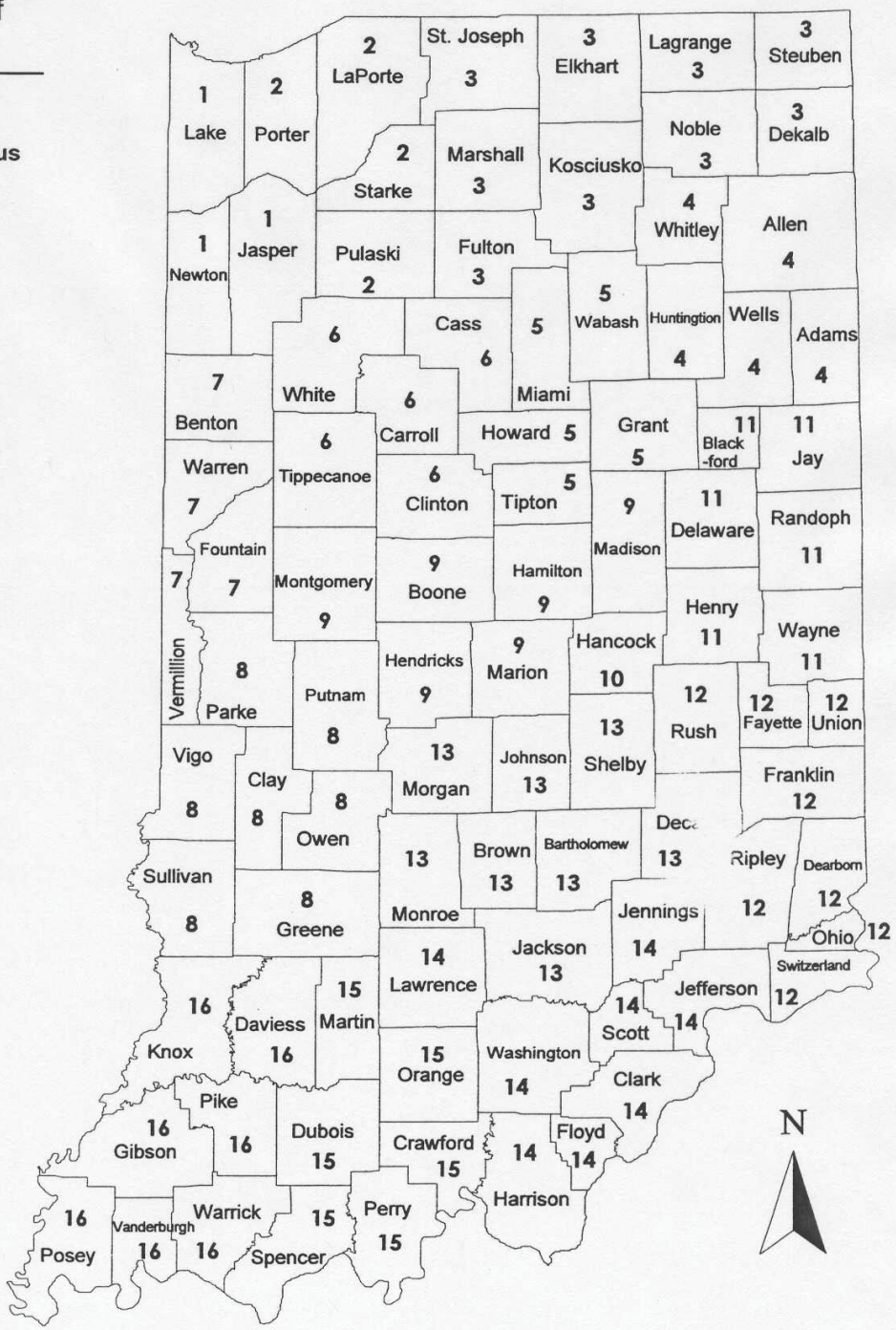

Appendix IX.
Map of Agricultural and Solid Waste Compliance Staff
Subject to Change

_____of_____

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AGRICULTURAL AND SOLID WASTE MANAGEMENT
CONFINED FEEDING OPERATION INSPECTION REPORT

File "L"
_____County
Routine / Complaint

Log ID: _____ **Inspector:** _____ **Inspection Date:** _____

Facility Name/Owner: _____

Address: _____ **Telephone:** _(____)_____

Site Location: _____

Animal Type: Swine, Beef, Dairy, Veal, Chicken, Turkey, Duck, Other_____ **Animals Capacity**_____

Type of Manure Management System: Lagoon, Pit, Feed Lot, Dry Storage, Other _____

Spills

(CIRCLE- Denotes violation)

Unpermitted Discharge [327 IAC 16-3-1(a)]	**Spill Not Reported** [327 IAC 2-6.1-5]	**Spill Not Managed Properly** [327 IAC 2-6.1-7] [327 IAC 16-3-1(c)]

Permit and Performance Standards

(CIRCLE- Denotes violation)

Approval Condition [327 IAC 16-4-2]	**Access Denied** [327 IAC 16-4-2(5)]	**Invalid Approval** [327 IAC 16-4-1]	**Minimize Non-Point Sources** [327 IAC 16-3-1(b)]	**Solid Manure Storage** [327 IAC 16-8-8]

Operational Standards

(CIRCLE- Denotes violation)

Maintenance and Operation [327 IAC 16-9-1(a & b)]	**Unapproved Manure Storage** [327 IAC 16-9-1(c)]	**Transport & Handling** [327 IAC 16-9-2]
Improper Freeboard [327 IAC 16-9-1(d)]	**Markers Not Maintained** [327 IAC 16-9-1(f)]	**Self Monitoring** [327 IAC 16-9-1(e)]	**Earthen Berm Not Maintained** [327 IAC 16-9-1(g)]
Vegetation Management System [327 IAC 16-9-1(h)]	**Feedlot Run-off** [327 IAC 16-9-1(i)]	**Dead Animal Compost** [327 IAC 16-9-3]

Records

(CIRCLE- Denotes violation)

Spill Plan [327 IAC 16-9-4 & 5]	**Approvals and MMP** [327 IAC 16-9-5(a)]	**Self Monitoring Reports** [327 IAC 16-9-5(b)(1)]	**Required Acre: Maintained** [327 IAC :0-1]	
Land Application Records [327 IAC 16-9-5(b)(3)]	**Marketing and Distribution** [327 IAC 16-9-5(b)(4)]	**Spill Documentation** [327 IAC 16-9-5(b)(5)]	**ack Waivers** [327 IAC 16-10-1(e)]	

COMMENTS: _____

Received by: _____

Appendix X.
IDEM CFO Inspection Report
Subject to Change

_____ of _____

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AGRICULTURAL AND SOLID WASTE MANAGEMENT
MANURE LAND APPLICATION INSPECTION REPORT

File "L"
_____ County
Routine / Complaint

Log ID: _____ **Inspector:** _____ **Inspection Date:** _____

Site Name: _____

Applicator's Name: _____ **Manure Generator:** _____

Address: _____ **Telephone:** _(____)_____

Site Location: _____

Animal Type: Swine, Beef, Dairy, Veal, Chicken, Turkey, Duck, Other_____ Manure Type: Solid, Liquid, Compost

Spills *(CIRCLE- Denotes violation)*

Unpermitted Discharge [327 IAC 16-3-1(a)]	**Spill Not Reported** [327 IAC 2-6.1-5]	**Spill Not Managed Properly** [327 IAC 2-6.1]

Application *(CIRCLE- Denotes violation)*

Run-Off [327 IAC 16-3-1(e)(2)(A)]	**Ponding** [327 IAC 16-3-1(e)(2)(B)]	**Frozen Ground** [327 IAC 16-10-3(f)(1)(2)]	**Transport & Handling** [327 IAC 16-9-2]
Over Application [327 IAC 16-10-2(b)]	**Spray Irrigation** [327 IAC 16-10-3(c)]	**Spray Irrigation (frozen ground)** [327 IAC 16-10-3(f)(3)]	**Spray Irrigation (flood plain)** [327 IAC 16-10-3(e)]
Manure Applied from Roadway [327 IAC 16-10-3(g)]	**Manure Applied to Erodible Soils** [327 IAC 16-10-3(h)]	**Manure Applied to Saturated Soils** [327 IAC 16-10-3(i)]	

Records *(CIRCLE- Denotes violation)*

Record Keeping [327 IAC 16-10-2]	**Information Sheets (as applicable)** [327 IAC 16-10-5]

Staging *(CIRCLE- Denotes violation)*

Staging 327 IAC 16-10-3(a)]	**Staging Location** [327 IAC 16-10-3(b)]

Setback Distances (in feet) **[327 IAC 16-10-4]**

(CIRCLE- Denotes violation)

(Circle Type of Application) Known Features	Liquid Injection or Single Pass Incorporation	Liquid Incorporation Application to Pasture; or Solid or Composted Manure Application	Liquid Surface A[illegible]lication Less than or Equal to 6 % Slope; or Residue Cover	[illegible] Than 6 % [illegible]ope
Public water supply wells and public water supply surface intake structures	**500**	**500**	**500**	**500**
Surface waters of the state	**25**	**50**	**100**	**200**
Sinkholes (measured from The surficial opening or The lowest point)	**25**	**50**	**100**	**200**
Wells	**50**	**50**	**100**	**200**
Drainage inlets	**5**	**50**	**100**	**200**
Property lines and Public Roads	**0**	**10**	**50**	**50**

COMMENTS: _____

_____

_____

_____

Received by: _____

Appendix XI.
IDEM CFO Land Application Inspection Report
Subject to Change

Indiana Statutes on Confined Feeding Operations

(Includes the amendments made in HEA 1915 (P.L.125-1997))

IC 13-18-10 Confined Feeding Control

IC 13-18-10-1 Department approval necessary for confined feeding operations

Sec. 1. A person may not start construction of a confined feeding operation without obtaining the prior approval of the department.

IC 13-18-10-2 Applications for approval

Sec. 2. (a) Application for approval of the construction of a confined feeding operation must be made on a form provided by the department. An applicant must submit the completed application form to the department together with the following:

(1) Plans and specifications for the design and operation of manure treatment and control facilities.

(2) A manure management plan that outlines procedures for the following:

(A) Soil testing.

(B) Manure testing.

(3) Maps of manure application areas.

(4) Supplemental information that the department requires, including t lowing:

(A) General features of topography.

(B) Soil types.

(C) Drainage course.

(D) Identification of nearest streams, ditches, and lakes.

(E) Location of field tiles.

(F) Location of land application areas.

(G) Location of manure treatment facilities.

(H) Farmstead plan, including the location of water wells on the site.

(5) A fee of one hundred dollars ($100). The department shall refund the fee if the department does not make a determination in accordance with the time period established under section 2.1 of this chapter.

(b) An applicant who applies for approval to construct a confined feeding operation on land that is undeveloped or for which a valid existing approval has not been issued shall make a reasonable effort to provide notice:

(1) to:

(A) each person who owns land that adjoins the land on which the confined feeding operation is to be located; or

(B) if a person who owns land that adjoins the land on which the confined feeding

operation is to be located does not occupy the land, all occupants of the land; and

(2) to the county executive of the county in which the confined feeding operation is to be located;

not more than ten (10) working days after submitting an application. The notice must be sent by mail, be in writing, include the date on which the application was submitted to the department, and include a brief description of the subject of the application. The applicant shall pay the cost of complying with this subsection. The applicant shall submit an affidavit to the department that certifies that the applicant has complied with this subsection.

(c) Plans and specifications for manure treatment or control facilities for a confined feeding operation must secure the approval of the department. The department shall approve the construction and operation of the manure management system of the confined feeding operation if the commissioner determines that the applicant meets the requirements of:

(1) this chapter;

(2) rules adopted under this chapter;

(3) the water pollution control laws;

(4) rules adopted under the water pollution control laws; and

(5) policies and statements adopted under IC 13-14-1-11.5 relative to confined feeding operations.

IC 13-18-10-2.1 Approval procedure; requirements; revocation

Sec. 2.1. (a) The department:

(1) shall make a determination on an application not later than ninety (90) days after the date the department receives the completed application, including all required supplemental information, unless the department and the applicant agree to a longer time; and

(2) may conduct any inquiry or investigation, consistent with the department's duties under this chapter, the department considers necessary before making a determination.

(b) If the department fails to make a determination on an application not later than ninety (90) days after the date the department receives the completed application, the applicant may request and receive a refund of an approval application fee paid by the applicant, and the commissioner shall:

(1) continue to review the application;

(2) approve or deny the application as soon as practicable; and

(3) refund the applicant's application fee not later than twenty-five (25) working days after the receipt of the applicant's request.

(c) The commissioner may suspend the processing of an application and the ninety (90) day period described under this section if the department determines within thirty (30) days after the department receives the application that the application is incomplete and has mailed a notice of deficiency to the applicant that specifies the parts of the application that:

(1) do not contain adequate information for the department to process the application; or

(2) are not consistent with applicable law.

(d) The department may establish requirements in an approval regarding that part of the confined feeding operation that concerns manure handling and application to assure compliance with:

(1) this chapter;
(2) rules adopted under this chapter;
(3) the water pollution control laws;
(4) rules adopted under the water pollution control laws; and
(5) policies and statements adopted under IC 13-14-1-11.5 relative to confined feeding operations.

(c) The department may amend an approval or revoke an approval:
(1) for failure to comply with:
(A) this chapter;
(B) rules adopted under this chapter;
(C) the water pollution control laws; or
(D) rules adopted under the water pollution control laws; and
(2) as needed to prevent discharges of manure into the environment that pollute or threaten to pollute the waters of the state.

IC 13-18-10-2.2 Construction of confined feeding operation

Sec. 2.2. (a) If an applicant receives an approval under this chapter and completes construction, not more than thirty (30) days after the date the applicant completes the construction the applicant shall execute and send to the department an affidavit that affirms under penalties of perjury that the confined feeding operation:
(1) was constructed; and
(2) will be operated;
in accordance with the requirements of the department's approval.

(b) Construction of an approved confined feeding operation must:
(1) begin not later than two (2) years; and
(2) be completed not later than four (4) years;
after the date the department approves the construction of the confined feeding operation or the date all appeals brought under IC 4-21.5 concerning the construction of the confined feeding operation have been completed, whichever is later.

IC 13-18-10-2.3 Manure management plan

Sec. 2.3. A confined feeding operation must submit a manure management plan that outlines procedures for soil testing, manure testing, and maps of manure application areas to the department at least one (1) time every five (5) years to maintain valid approval for the confined feeding operation under this chapter.

IC 13-18-10-2.6 Compliance and technical assistance program

Sec. 2.6. The department shall establish a compliance and technical assistance program for owners and operators of confined feeding operations that may be administered by:
(1) the department;
(2) a state college or university; or
(3) a contractor.

IC 13-18-10-3 Enforcement of chapter

Sec. 3. This chapter, including requirements established in a department approval under

section 2 of this chapter, may be enforced under IC 13-30-3 or IC 13-14-2-6.

IC 13-18-10-4 Rules, policies, and statements; uniform standards

Sec. 4. (a) The board may adopt rules under IC 4-22-2 and IC 13-14-9 and the department may adopt policies or statements under IC 13-14-1-11.5 that are necessary for the proper administration of this chapter. The rules, policies, or statements may concern construction and operation of confined feeding operations and may include uniform standards for:

(1) construction and manure containment that are appropriate for a specific site; and

(2) manure application and handling that are consistent with best management practices:

(A) designed to reduce the potential for manure to be conveyed off a site by runoff or soil erosion; and

(B) that are appropriate for a specific site.

(b) Standards adopted in a rule, policy, or statement under subsection (a) must:

(1) consider confined feeding standards that are consistent with standards found in publications from:

(A) the United States Department of Agriculture;

(B) the Natural Resources Conservation Service of the United States Department of Agriculture;

(C) the Midwest Plan Service; and

(D) university extension bulletins; and

(2) be developed through technical review by the department, university specialists, and other animal industry specialists.

IC 13-18-10-5 Injunctive relief

Sec. 5. The department may seek injunctive relief under this chapter.

IC 13-18-10-6 Violations; penalties

Sec. 6. A person who violates this chapter is subject to the penalties imposed by the following:

(1) IC 13-30-4.

(2) IC 13-30-5.

(3) IC 13-30-6.

(4) IC 13-30-8.

Definitions that Apply to IC 13-18-10 Confined Feeding Control

IC 13-11-2-39 "Confined feeding"

Sec. 39. (a) "Confined feeding", for purposes of IC 13-18-10, means the confined feeding of animals for food, fur, or pleasure purposes in lots, pens, ponds, sheds, or buildings where:

(1) animals are confined, fed, and maintained for at least forty-five (45) days during any twelve (12) month period; and

(2) ground cover or vegetation is not sustained over at least fifty percent (50%) of the animal confinement area.

(b) The term does not include the following:

(1) A livestock market:

(A) where animals are assembled from at least two (2) sources to be publicly auctioned or privately sold on a commission basis; and

(B) that is under state or federal supervision.

(2) A livestock sale barn or auction market where animals are kept for not more than ten (10) days.

IC 13-11-2-40 "Confined feeding operation"

Sec. 40. "Confined feeding operation", for purposes of IC 13-18-10, means:

(1) any confined feeding of:

(A) at least three hundred (300) cattle;

(B) at least six hundred (600) swine or sheep; and

(C) at least thirty thousand (30,000) fowl;

(2) any animal feeding operation electing to be subject to IC 13-18-10; or

(3) any animal feeding operation that is causing a violation of:

(A) water pollution control laws;

(B) any rules of the water pollution control board; or

(C) IC 13-18-10.

A determination by the department under this subdivision is appealable under IC 4-21.5.

IC 13-11-2-40.8 "Construction"

Sec. 40.8. "Construction", for purposes of IC 13-18-10, means the fabrication, erection, or installation of a facility or manure control equipment at the location where the facility or manure control equipment is intended to be used. The term does not include the following:

(1) The dismantling of existing equipment and control devices.

(2) The ordering of equipment and control devices.

(3) Offsite fabrication.

(4) Site preparation.

IC 13-11-2-148 "Operator"

Sec. 148. (a) "Operator", for purposes of IC 13-18-10, means the person in direct or responsible charge or control of one (1) or more confined feeding operations.

(b) "Operator", for purposes of IC 13-18-11 and environmental management laws, means the

person in direct or responsible charge and supervising the operation of:

(1) a water treatment plant;

(2) a wastewater treatment plant; or

(3) a water distribution system.

(c) "Operator", for purposes of IC 13-20-6, means a corporation, a limited liability company, a partnership, a business association, a unit, or an individual who is a sole proprietor that is one (1) of the following:

(1) A broker.

(2) A person who manages the activities of a transfer station that receives municipal waste.

(3) A transporter.

(d) "Operator", for purposes of IC 13-23, means a person:

(1) in control of; or

(2) having responsibility for;

the daily operation of an underground storage tank.

IC 13-11-2-158 "Person"

Sec. 158. (a) "Person", for purposes of:

(1) IC 13-21;

(2) air pollution control laws;

(3) water pollution control laws; and

(4) environmental management laws, except as provided in subsections (c), (d), (e), and (h);

means an individual, a partnership, a copartnership, a firm, a company, a corporation, an association, a joint stock company, a trust, an estate, a municipal corporation, a city, a school city, a town, a school town, a school district, a school corporation, a county, any consolidated unit of government, political subdivision, state agency, a contractor, or any other legal entity.

(b) "Person", for purposes of:

(1) IC 13-18-10; and

(2) IC 13-20-17;

means an individual, a partnership, a copartnership, a firm, a company, a corporation, an association, a joint stock company, a trust, an estate, a political subdivision, a state agency, or other legal entity, or their legal representative, agent, or assigns.

(c) "Person", for purposes of:

(1) IC 13-20-13;

(2) IC 13-20-14;

(3) IC 13-20-16; and

(4) IC 13-25-6;

means an individual, a corporation, a limited liability company, a partnership, or an unincorporated association.

(d) "Person", for purposes of IC 13-23, has the meaning set forth in subsection (a). The term includes a consortium, a joint venture, a commercial entity, and the United States government.

(e) "Person", for purposes of IC 13-25-3, means an individual, a corporation, a limited liability company, a partnership, a trust, an estate, or an unincorporated association.

(f) "Person", for purposes of IC 13-26, means an individual, a firm, a partnership, an

association, a limited liability company, or a corporation other than an eligible entity.

(g) "Person", for purposes of IC 13-29-1, means any individual, corporation, business enterprise, or other legal entity either public or private and any legal successor, representative, agent, or agency of that individual, corporation, business enterprise, or legal entity.

(h) "Person", for purposes of:

(1) IC 13-30-6-6;

(2) IC 13-30-6-7; and

(3) IC 13-30-8-1;

has the meaning set forth in IC 35-41-1.